Astronomia Carolina.

A NEW
THEORIE
OF THE
Cœlestial Motions.

Composed according to the Best Observations and most Rational Grounds of Art.

Yet far more Easie, Expedite and Perspicuous than any before Extant.

WITH

Exact and most Easie Tables thereunto, and Precepts for the Calculation of Eclipses, *&c.*

By THOMAS STREETE, Student in *Astronomy* and *Mathematicks*.

LONDON,
Printed for *Lodowick Lloyd*, and are to be sold by *Robert How*, Bookseller, in Castle-street in *Dublin*, 1663.

Long^o [illegible]

Sedan Lansbergius a fortunatis in m[illegible] 25 30' distat Goesa sua. [illegible]

[illegible] gr. 5 sive minutis hor. 0 20

He The yeare begins with him at the vulgarly [illegible] December 31^th at Noon

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To His Sacred Majeſtie

Charles the Second,

By the Grace of God, King of *Great Britain*, *France* and *Ireland*, Defendor of the Faith, *&c.*

Dread Soveraigne,

THe Gifts of God are infinitely Good, and his Gracious and Miraculous Preſervation and Reſtauration of Your Sacred Majeſtie unto us Your Subjects, for ever to be acknowledged with thankful hearts, as Mercies farre beyond our demerits: Great and Wonderful are all his Workes! Hee often performeth mighty and incredible things by weak and inconſiderable inſtruments: The Vaſt extent of the Univerſe, with the Harmonious Order and Motion of the Cœleſtial Bodies, are ſtrong and convincing Teſtimonies of his Incomprehenſible Wiſdom and Power; Day unto day uttering ſpeech, and night unto night ſhewing knowledge. In the ſad and doleful Night of Your Sacred Majeſties abſence from Your People, was this ſmall Aſtronomical Work begun, and carefully continued for ſome years; but our Sun was not yet riſen, and Providence had ſo ordered it, that the Motion of one of the Planets remained uncertain; ſo that Aſtronomy could not be compleatly Rectified until the happy

Day of Your Sacred Majesties Coronation, at which time the favourable Heavens afforded us a rare and most remarkable Appearance of *Mercury* in the *Sun*, to the accomplishment of our desired end in this Art; And this little Book now finished, the Author most humbly Presenteth, and Dedicateth unto Your Supreme and Sacred Majestie, Your most Splendid Name being alone sufficient to Dispell the very Darknesse of Ignorance, and thickest Clouds wherewith Envy would infest it. Long may Your Majestie Reign over us, to the great encouragement of Vertue, discouragement of vice, and unexpressible comfort of all your Loyal Subjects, as farre out-shining all Earthly Monarchs, as the Sun doth the smallest star: And when You have exchanged this temporary for a more Glorious Crown of Immortality, may the Succession of Your Royal Line, and Sacred Memory of Your Kingly Vertues, be as Permanent as the Heavenly Motions; So ever prayeth

Your Majesties most Humble

&

Most Loyal Subject,

THO. STREETE.

TO THE

READER.

Courteous Reader,

WEE intend not here to insist on the great Utility, Antiquity and Excellency of Astronomy, *but briefly by way of Preface to inform thee, That wee doubt not but those Fundamentals, wherein wee differ from all or most Astronomers whose Works are extant, will upon due examination be found more agreeable unto truth, and that Posterity will with us reject those many impertinencies which (notwithstanding the vast expences of King* Alphonsus, *and the like of the Noble* Tycho Brahe, *with his many accurate Observations, and the great ingenuity and rare discoveries of* Copernicus, Kepler, Galileus, *and some others) have been to this day very burthensome, clouding much truth from our sight, and remaining but as a clog to the contemplation of the wonderful visible Works of* Jehovah, *who without them is less visible unto us.*

The Astronomy of the Spere being already treated of at large by many, and the Doctrine of Triangles by Mr. Briggs, Gellibrand, Norwood, *and other able Mathematitians of our own and other Nations, Wee have here undertaken the Theoretical Part, and therein with great labour and diligence endeavoured to remove the greatest Obstacles, as the unnatural Translations and never to be proved Motions of the* Aphelions *and* Nodes *of the Primary Planets, with other unproportionable and false suppositions, which have hitherto hindred a clear speculation into this most pleasant and profitable Art, rendring it intricate, harsh, tedious, and uncertain; so many several Theories much differing amongst themselves, and from the Heavens, being therefore altogether dis-satisfactory, because in most respects untrue.*

And be pleased to take notice, That upon good grounds wee are so farre assured of the verity of our Æquation of Time for the inequality of Natural Days, and of the neer agreement of our Lunar Theory to the Phænomenon, *that hence the Science of the Longitudes or Difference*

of

of Meridians, as well at Sea as Land (which some wanting these Principles have been too forward to boast of) may be farre more truely obteined then formerly it hath been; and if it be but rightly valued by those whom it most concerns, wee easily can, and (God willing) shall in short time proceed herein to a farther degree of exactness.

But to give the Reader a brief account of this little Treatise.

1 *Wee present thee with a New, Easie, Geometrical and Harmonious Theory, wherein wee demonstrate the Planetary Motions, with the direct method whereby all our Numbers are exactly limited.*

2 *The Use of our Tables, with most plain and easie Examples of finding the true Places of the Fixt and Wandring Stars, with the Eclipses of the Luminaries at all times.*

3 *For farther satisfaction of the Reader, and proof of the verity of our Hypothesis and Numbers, wee have compared our Calculations with all the best and most certain Ancient and Modern Observations.*

4 *Our Astronomick Tables follow in Order, with some other necessary Tables to be used together with them.*

All Glory be to God the giver of all good gifts; The ease and benefit of these our Labours to the Candid Reader, whose grateful acceptation may (in convenient time) produce a larger return of endeavours from

Your Real Friend,

THO. STREETE.

OF

OF THE

Viſible VVorld

AND

Planetary Syſteme.

THe Viſible World and every part thereof conſiſts of three Principles, *Sulphur*, *Salt*, *Mercury*:

The *Sulphur* or Soul of the World, from whence proceedeth heat and light, is moſt manifeſt in the glorious bodies of the Sun and Fixt-Stars.

The *Salt* or Corporiety of all things is the chief conſiſtence of the Planets *Saturn* and *Jupiter*, with their Attendants, *Mars*, our Earth with the *Moon*, *Venus*, and *Mercury*.

The *Mercury* or Spirit of the Univerſe operates through the *Æther* and fluid *Medium*, wherein all viſible bodies have their place and motion.

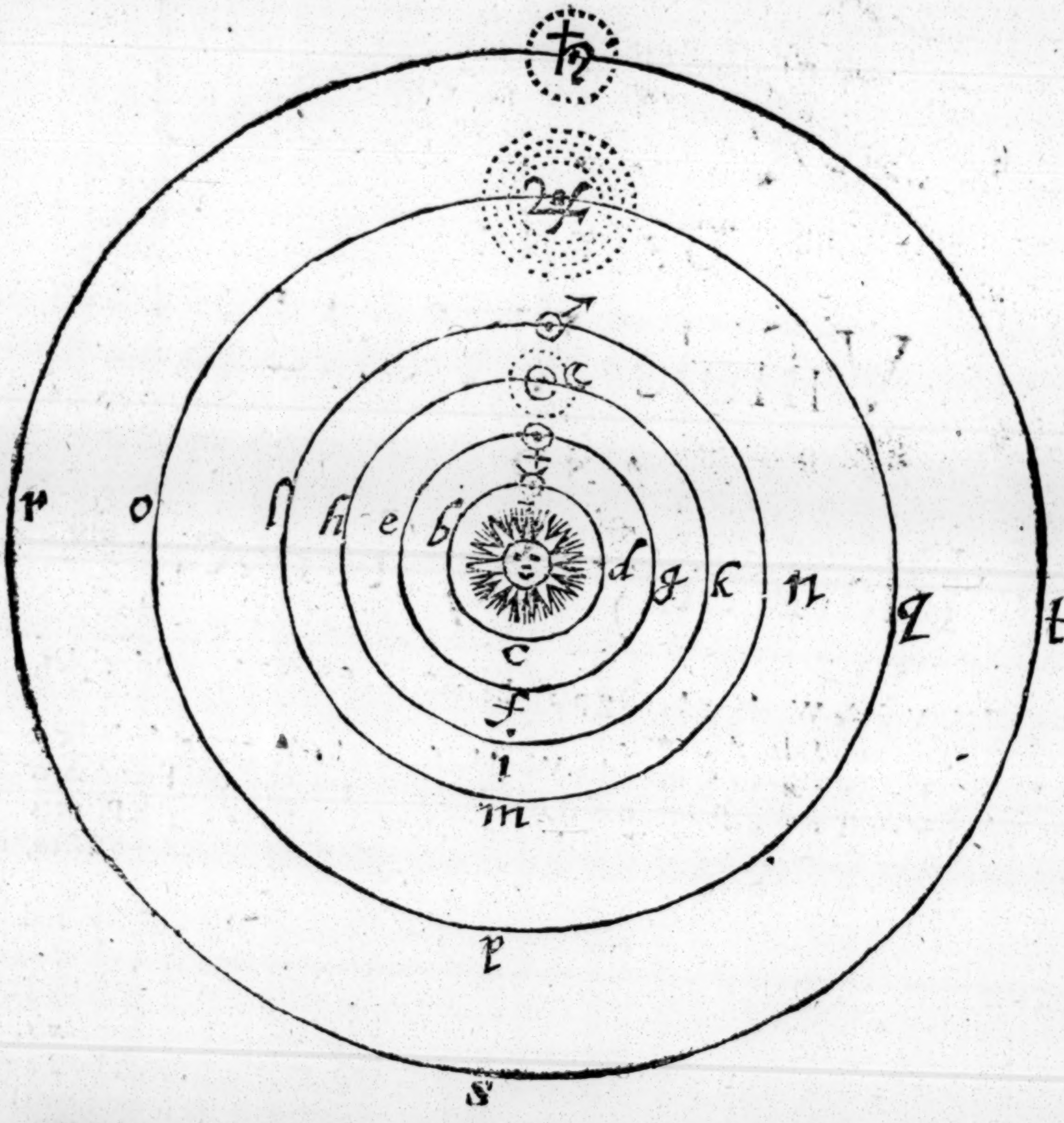
The *Planetary Syſteme* preſents it ſelf in this wiſe.

Firſt, The Sun hath only a rotation from *Weſt* to *Eaſt* upon his proper *Axis*, in the ſpace of twenty ſix days or thereabouts (as hath been gathered by *Teleſcope*-Obſervations of the motion of certain ſpots appearing (at ſome times) in his body,) his Center being an immovable Point, to which the Revolutions of all the Planets are referred.

The Planets are likewiſe moved about the Sun from *Weſt* to *Eaſt* in ſeveral Orbs or Lines returning into themſelves, every Planet in time exactly

pro-

proportionable to the Magnitude of his Orb and distance from the Sun, the revolutions of the primary Planets being uniform, and all perpetually constant and regular, as shall be proved in its due place: in the mean time observe this Figure,



Wherein ☿ *b c d* ☿ denotes the way and revolution of the Planet *Mercury* about the Sun in 88 days; ♀ *e f g* ♀ the revolution of *Venus* in 225 days; ⊖ *h i k* ⊖ the revolution of the Earth with the *Moon* in one year; ♂ *l m n* ♂

the revolution of *Mars* in two years; ♃ *o p q* ♃ the revolution of *Jupiter* with his four companions in twelve years; ♄ *r s t* ♄ the revolution of *Saturn* with his Ring and Moon in thirty years.

The Moon alſo circumvolveth the Earth every moneth; *Jupiters* four Attendants, him, in time correſponding their diſtances from him, the firſt and next him in one day 18 houres, the ſecond next without that in three days 13 houres, the third in ſeven days four houres, and the fourth and outermoſt in 16 days five houres; *Saturns* Moon moves about him in 16 days, and all from Weſt to Eaſt, according to their revolutions about the Sun.

Saturn, *Jupiter*, *Mars*, the *Earth*, *Venus* and *Mercury* (whoſe revolutions reſpect the Sun only) are called Primary Planets, the reſt (that move again about *Saturn*, *Jupiter*, and the *Earth*) Secondary.

And beſides theſe motions (truely though rudely here deſcribed in this ſmall Figure) its not improbable that every Primary Planet hath his proper revolution upon his *axis*, as the Sun hath his in 26 days, and the Earth hers upon her Æquinoctial Poles in 24 hours from Weſt to Eaſt.

The Secondary Planets are all of them much leſs in magnitude then their Primary, and all the Planets together much leſs then the Sun, from whom they all receive their light, virtue and principal power of motion, he is really one of the Fixt Starres:

And farre without this Planetary Syſteme are placed all the reſt of the Fixt Starres, in ſeveral diſtances, but all unto us incommenſurable, the Parallax of of the Earths Orbe (of which more in place convenient) being inſenſible in any of their places; their number is alſo indeterminable, yet is it not unlikely but they may all have their Planets or Worlds moved about them, as our Sun hath.

But for proof that all theſe Planets of our Syſteme are illuminated by the Sun; Its obſerved by help of the Teleſcope, that *Venus* and *Mercury* do oft times appear horned, increaſing and decreaſing in light as the Moon doth, they and *Mars* being alwayes in convenient poſitions found deficient of their light in the obverſe part from the Sun; As for *Jupiter* and *Saturn*, their Orbes bear too large a proportion to the Earths for making any ſuch appearance of the defection of their light; Yet *Jupiter* eclipſing any of his *Satellites* when interpoſed betwixt the Sun and them (as is reported to have been obſerved) will eaſily ſhew whence he and they have their light.

And whereas ſome have held opinion that *Saturn* and *Jupiter* are too farre diſtant from the Sun for their receiving ſo much light from him, and that they have therefore ſome light of themſelves; I ſay its ſufficiently proved in the Opticks, that the farther a luminous body is diſtant, though it appears thereby ſo much the leſſer, yet the light thereof being contracted is ſo much the purer, ſo that without farther diſpute, theſe two Superior Planets with

 those

thoſe leſſer attending them have as well as the reſt their light from the Sun.

And that the Earth ſhines at a diſtance with like ſplendor as her fellow Planets, will eaſily appeare by her illuminating the darker part of the Moons ſubvolvane or lower hemiſphere, as is commonly ſeen a little before or after the Change, for then to the Moone the appearance of the Earths light is neere the Full.

The next thing we ſhall take notice of, is that the Sun and all the Primary Planets, with their attendants (excepting only a flat ring which encompaſſeth *Saturn*) are of Spherical Forme, or not conſiderably differing from it, as may be gathered by the beſt obſervations made with the Teleſcope and other wayes.

And for farther demonſtration of the affinity of the Earth with the other Planets, we might here inſtance the different formes obſerved in the Moon, which queſtionleſs can be no other then Sea and Land, the dark parts lying lower then the reſt having the true forme of Seas; and the ſhining parts higher and full of inequalities, by their ſolidity not ſuffering the Suns light to penetrate (as the waters do) but more ſtrongly reflecting it: *Galileus* gives this farther reaſon, that the reflection of the Earth, being from infinite planes muſt neceſſarily make an univerſal appearance, whereas that of the water can be but to one certain determinate point.

And as in this ſecondary Planet the Moone, ſo in moſt (if not all) of the Primary Planets, are certain ſpots or girdles, darker then the reſt of their bodies, to an armed eye obſervable; but theſe, by reaſon of their greater remotion from us (though ſufficient to the matter in hand) will not admit of any ſuch exact deſcription as we have in our Selenographicall Maps and Tables.

The Moon hath been alſo obſerved to have (as well as the Earth) her Atmoſphere, or a thick vaporous air encompaſſing her body and refracting the Suns rayes in Solar Eclipſes; from which with other conſiderations, we may rationally conclude that all the Planets have the like.

And thus, in the original ſubſtance, harmonious motion, magnitude, Illumination from the Sun and outward Form of the Planets, we may ſee their affinity amongſt themſelves, in this and the placing of the Sun and Fixt Starres in convenient diſtances, the admirable concinnity and immenſe vaſtitude of the Univerſe, and in all things the infinite Wiſdom, Power and Excellencie of the TRI-UNE-BEING their Eternal Author.

Touching *New* ſtarres and Comets; after due conſideration of what hath been obſerved concerning them, we may determine that New ſtarres are (far without our Planetary Syſteme) by the viciſſitudes of Nature, a concourſe of like fiery matter, as that whereof the Sun and Fixt Starres do Conſiſt; but in theſe new appearances, commonly the weaker intention in Nature

being

being not able to contract the matter into a perfect body, its again by degrees remitted and finally dissolved into its former invisibility; and these during their continuance are fixt in one place as the Fixt-starres. But Comets do alwayes appeare unto us much nearer, and amongst the Orbes of the Planets; they are generated of Planetary substance, but incompact and dissolvable, Illuminated (as the Planets) by the Sun; and according to the general consent of observations, their motions are (as *Kepler* defines them) in or near to right lines.

The old supposition of Solid Orbes to support and carry the Planets, I count scarce worth the mentioning; The Earth we see hath no such Orbe, and Nature it self with all observations of the true motions of secondary Planets and of Comets plainly demonstrating the impossibility of any such thing.

Nor shall I here mention any of those many and grose absurdities, which will necessarily follow in all such Systemes, as attribute to the Sun or Fixt-Starres any of the Earths natural motions.

But farther to cleer the truth from all seeming contradictions; Whereas we see that all Corporeal Substances apperteining to this our Earthly Globe do (proportionably to their quantities) tend downward towards the Earths center; Let us observe that this comes to pass by the Natural Magnetick power of the Earth, attracting its parts, a property common to every one of the Planets, whereby (according to the Creators will) they became compact bodies, and do retein their constant Form; The Sun also and Fixt Starres (though of a different Principle) having the like retentive Faculty.

And that the Aire, the Clowds, a bird flying, a stone falling from any height, an arrow or bullet shot or driven any way, and all things else within the Sphere of the Earths activity (whether otherwise moved or not) do Naturally and exactly follow her Annual and Diurnal Motion, so that we the Earths Inhabitants cannot possibly perceive or be made sensible thereof, any other way then by such real demonstrations as are here given; We shall exemplify this in the Planets *Jupiter* and *Saturn*, whose attendants (at a farre larger distance) do not only keep their constant revolutions about them, but together with them about the Sun; the like doth our Moone about the Earth, and both about the Sun. So that by the impulse and universal consent of Nature (whether accidentall motions be annexed or not) all things so neere the Earth do precisely keep the same motion with it.

Of the Sun's Parallax.

THe Suns Parallax is an Angle at his Center subtended by the Earths Semidiameter, or the difference between his true place in respect of the Earths Center and his visible place from som point of her Superficies.

Which Angle or difference is of so great concernment in Astronomy, that without it we can never make any such Theory and Tables of the Cœlestial motions, as shall be proved near enough consentaneous unto truth.

Therefore, that we may truly examine and obtaine the quantity of this Angle, we are first to consider, that the opinions of *Hipparchus*, *Ptolomy*, *Albategnius*, *Tycho*, *Longomontanus*, *Lansberg*, *Bullialdus* and others, who have supposed the Suns Horizontal Parallax from about 3′. to 2 $\frac{1}{3}$. are not grounded on any real Observations, or certain demonstrative principles, and therefore to be rejected.

Yet *Kepler* by *Tycho's* observations and his own, finding the Horizontal Parallax of *Mars* in his Acronychial positures to be in a manner insensible, and knowing by undoubted *Axioms* that the Sun's Parallax must be much less, was notwithstanding (as it seemes) not willing to confide overmuch in those animadversions, and so diminisht it to 1′.

But since our worthy English man Mr. *Jeremy Horrox*, comparing his own observations with others, hath sufficiently proved, that the greatest Parallax of *Mars* in opposition to the Sun, is scarce at all observable, and never amounting fully to 1′, by which and his excellent Telescope-observation of *Venus* in the Sun, with her apparent diameter at that time, and other good arguments, he determines the Sun's Horizontal Parallax 15″ and no more; which small quantity, agreeing well with the most diligently observed Semidiameters of all the Planets, and being farther confirmed by all our best Telescope-observations of the Moon's Dichotomies and otherwise, we accept of, as nearest the truth, and sufficiently exact.

Now the Sun's greatest Parallax being 15″, it follows by the most exact observations of Noble *Tycho Brahe*, Mr. *Edward Wright* and divers others, that the corrected obliquity of the Ecliptick is just. 23°. 30′.

Of the Theory of the Primary Planets Motions.

THat most ingenious Astronomer *Kepler*, by the help of *Tycho's* accurate Observations, first discovered that the ways of the Primary Planets about

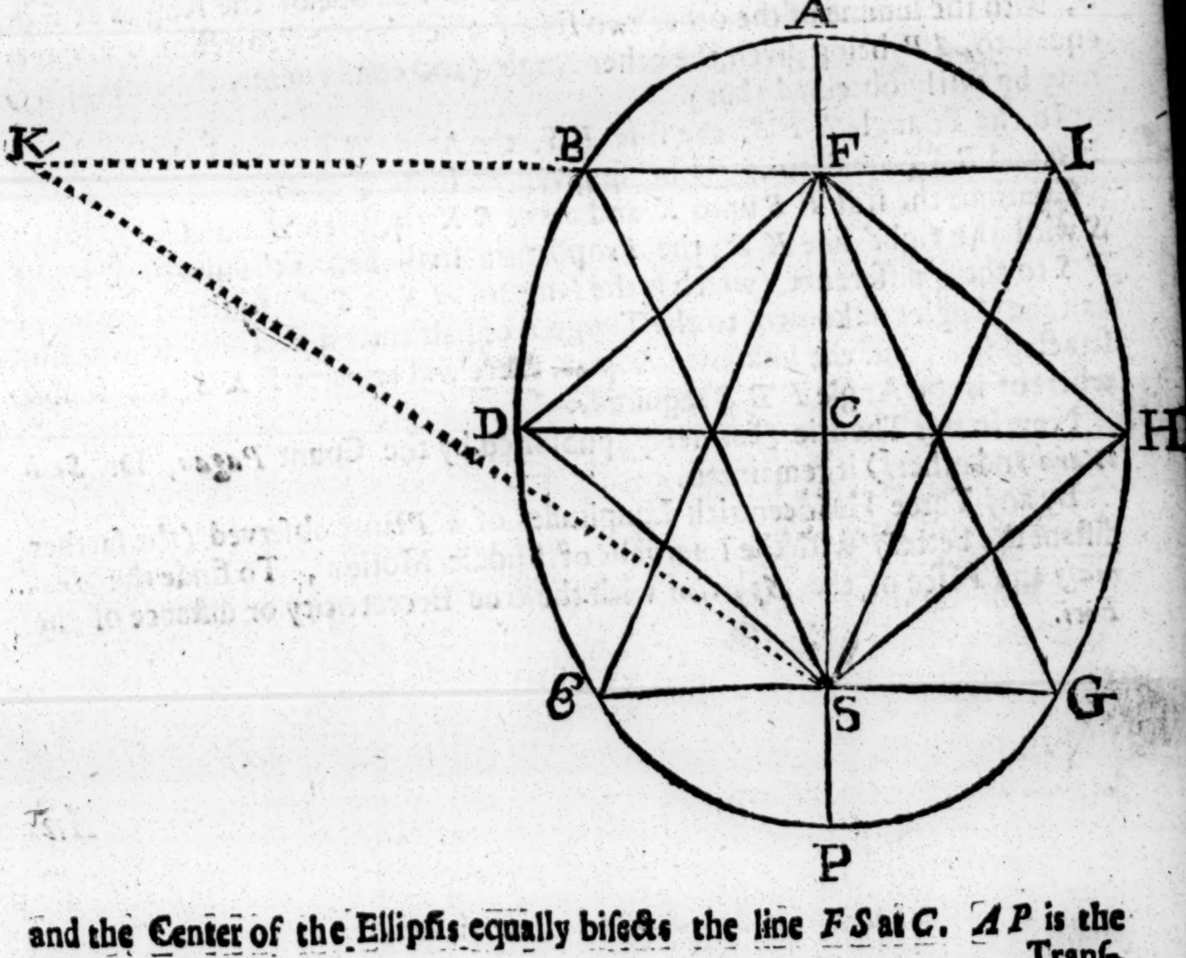
the

the Sun are Elliptical, as is very perceptible in the motions of *Mercury* and *Mars*, and no way contradicted in the rest.

Now what an Ellipsis is, *Apollonius Pergaus* in Conicis, *Claudius Mydorgius* and others have well defined and explicated ; but here to give an easy demonstration convenient to our purpose ;

In the Revolution of a right lined Triangle in a Plane, so that the base shall be immovable, and the summe of the other two sides constant, the motion of the point at the angle opposite to the base describeth an Ellipsis, whose Umbiliques are the fixed points at the other two angles.

The most usual way of drawing this Ellipsis, is with a threed, fastening both ends together, and upon a plain table sticking down two pinns, at any convenient distance (as at *F* and *S*) then laying the threed over them, and with the point of an other pinne or of a penne, bearing it out and carrying your hand about, you may describe the Ellipsis *A. B. D. E. P. G. H. I. A.* whose Umbiliques or Foci are in the place of he two immovable pinnes *F* and *S*,



and the Center of the Ellipsis equally bisects the line *FS* at *C*. *AP* is the Trans-

Transverse and longest diameter of the Ellipsis, *D H* the Conjugate and shortest.

S denotes the place of the Sun's center, to which the True Motion of the Planet is referred, *F* the other *Focus* whereunto the Middle or Equall Motion is numbred, *A* the *Aphelion* where the *Planet* is farthest distant from the Sun and slowest in Motion, *P* the *Perihelion* where the *Planet* is nearest the Sun and swiftest.

And observe that in *A* and *P* the line of the Mean and True Motion do convene, so that in either of these points the *Planet* is free from inequality, but in all other points the Mean and True Motion differ, and in *D* and *H*. is the greatest Elliptick æquation.

Now suppose the *Planet* in *B*, the line of the Middle Motion (according to this Figure) is *F B*, the line of the True Motion *S B*, the mean *Anomaly A F B*, the Elliptick æquation or *Prostaphæresis FB S* which (in this example) substracted from *A F B* there will remain the True *Anomaly A S B*.

And here note, that in the right lined Triangle (as *F B S*, *F D S*, *F E S*, *F G S*, *F H S* or *F I S*) the constant side *F S* and one of the Angles at *F* or *S*, with the summe of the other two sides (which by the *Projection* is alwayes equall to *A P*) being given, the other Angles (and consequently the sides apart) may be easily obteined thus;

In the Triangle *B F S*, the side *F S*, the Angle *B F S*, and the summe of *F B* and *B S* (equall to *A P*) being given, to finde *F B S*;

Continue the side *F B* unto *K* and make *B K* equall to *B S* and joyn *K* and *S* with the right line *K S*; the *Proportion* shall be, As the sum of *K F* and *F S* to their difference (which is the same as *A S* to *S P*) so the Tangent of half the Angles unknown, to the Tangent of half their difference, which substracted from half the unknown Angles, there will remaine *F K S*, the double whereof is the Angle *F B S* required,

Now in this Theorie (formerly published by the Count *Pagan*, Dr. *Seth Ward* and others) it remaineth,

By any Three Heliocentrick Longitudes of a *Planet* observed (the farther distant the better) with the Intervalls of Middle Motion, To finde the *Anomaly* and Place of the *Aphelion* with the true Eccentricity or distance of the *Foci*.

An

An Inveſtigation of the Earths Aphelion *and Annual Inequality.*

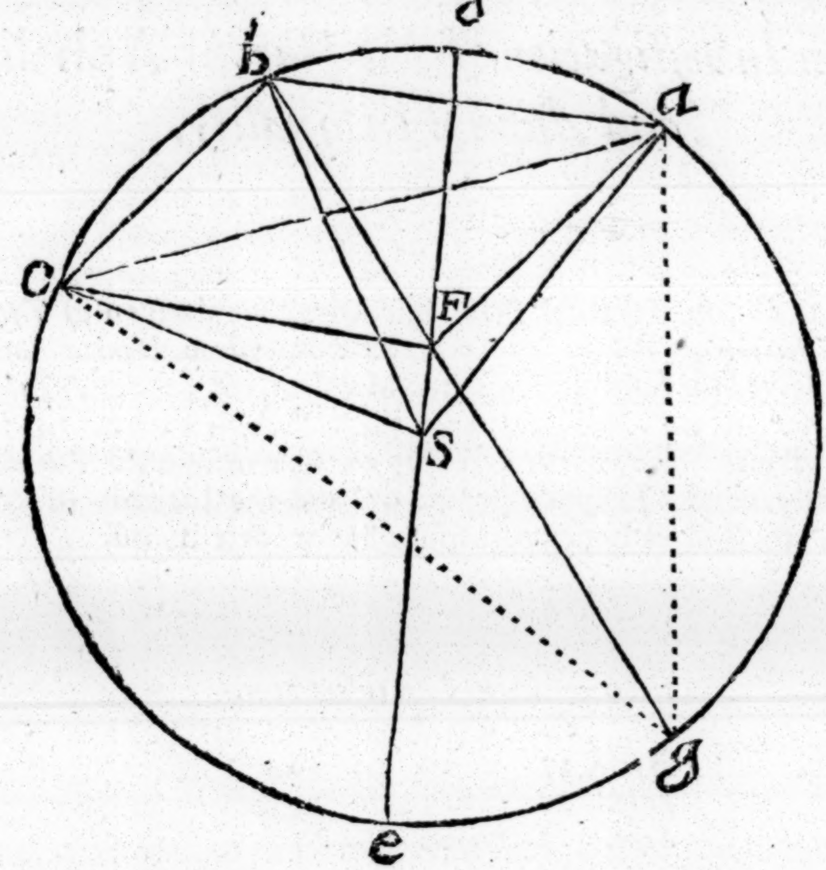
ANno 1586. *April* the 27th (Old Stile, which we always uſe) *Tycho Brahe* at *Uraniburg* (as *Longomontanus* relates in *Aſtron. Danica Theoric.* Lib. 1. c.2.) obſerved the Suns altitude in the Meridian 50° 52′ 30″. *July* the 27th following 50° 56′ 30″: and *September* the 13th the ſame year 34° 7′ 0″. by which Meridional Altitudes corrected by our fore-mentioned *Parallax*, with the Obliquity of the Ecliptick 23° 30′ 0″ and the Latitude of *Uraniburg* 55° 54′ 30″ theſe three Longitudes of the Sun are determined.

1586——*Locus Solis obſervatus.*

	die.	*S*	°	′	″
April.	27.	♉	16	24	28
July.	27.	♌	13	21	35
Sept.	13.	♍	29	55	44

Then upon the point *S* (repreſenting the fixt place of the Sun) we deſcribe the Circle *a d b c e g*, whoſe ſemidiameter is equall to the Tranſverſe diameter of the Earths Ellipſis; And by the places of the Earth in the firſt ſecond and third Obſervations wee draw the ſemidiameters *S a*, *S b*, *S c*, and alſo from *F* (denoting the place of the other *Focus*) the right lines *F a*, *F b*, *F c*.

Now becauſe (as was ſhewed before) the Angles *F a S*, *F b S*, *F c S*, are equal to half the Angles of æquation in the Ellipſis; Hence the Angles *a F b*, *b F c*, &c. are eaſily found as followeth.



From the first Observation to the second are 91 days.

The Apparent Motion is the Arch *a b*.	86°	57′	7″
The Middle Motion in 91 days.	89	41	38
The Summe	176	38	45
The half whereof is the Angle *a F b*.	88	19	22

From the second Observation to the third are 48 days.

The Apparent Motion is the *Arch b c*.	46°	34′	9″
The middle motion in 48 days.	47	18	40
The Summe.	93	52	49

Th

The half whereof is the *Angle b F c.* ——— 46° 56′ 24″

From the first Observation to the third are 139 days.

The *Apparent* motion is the *Arch ac.* ——— 133° 31′ 16″
The middle motion in 139 days. ——— 137 0 18

The Summe. ——— 270 31 34
The half whereof is the *Angle a F c.* ——— 135 15 47

Then supposing the Logarithm of *c F.* 10.000000. extending *b F* to *g* and drawing those other right lines as in the Figure, we proceed by the method of *Herigonus.*

1. In the Triangle *c F g* are given *c F g* the Complement of *b F c* to a semicircle, *c g F* the half of *b S c* the *Angle* at the Center, and *c F* as above, required *F g*,

F g c. 23°. 17′. 4″. —sin. ——— 9.596922
F c g. 23. 19. 20. —sin. + *c F.* — 19.603401
F g. ——— 10.006479

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2. In the Triangle *F g a.* are given *F g. F g a* the half of *b S a.* *g F a* Complement of *b F a.* required *F a.*

F a g. 44° 50′. 49″. sin: ——— 9.848322
F g a 43. 28. 33. sin: ——— 9.837619
F g. ——— 10.006479
19.844098
F a ——— 9.995776

---

3. In The Triangle *c a F,* are given *F a, c F, c F a.* required *F a c, c a.*

c F + rad: ——— 20.000000
F a ——— 9.995776

45.16.43.tan. ——— 10.004224

r: 0.16.43.tan. ——— 7.686874
22.22.6.tan. ——— 9.614395
0.6.53.tan. ——— 7.301269

F a c ——— 22.28.59. sin: ——— 9.582530
c F a ——— 135.15.47. sin. + *c F*— 19.847482
c a ——— 10.264952

---

4. In

4. In the Isosceles Triangle *c S a.* are given *c a, c S a.* required *c S.* and from the angle *S c a* substract *F c a* there is left *F c S.*

c S a 133°. 31′. 16″. sin:	—	9.860410
S a c. 23. 14. 22. sin:	—	9.596129
c a	—	10. 264952
		19. 861081
c S	—	10. 000671

5. In the Triangle *F c S.* are given *c F, c S, F c S.* required *F S c, F*

c S + rad:—*c F.*

45°. 2′. 39″. tan.	—	10. 000671
rad: 0. 2. 39. tan:	—	6. 886892
89. 30. 25. tan	—	12. 065218
5. 7. 4. tan.	—	8. 952110
F S c. 84 23. 21. sin:	—	9. 997914
F c S. 0 59. 9. sin: + rad:		18. 235659
F S,	—	8. 237745

The Place of the Sun in the third observation ——— 5ˢ. 29°. 55′. 4
The True Anomaly *F S c* substract ——— 2. 24. 23. 21

The Apogæon of the Sun ——— 3. 5. 33. 2
Aphelion of the Earth. ——— 9. 5. 32. 23

For the Eccentricity of the Earth in such parts as her mean distance fro the Sun is, 100000. the proportion is

C S	—	10. 000671
F S	—	8. 237745
Mean dist. 100000	—	5.000000
Eccentricity. 1726	—	3.237074

And for the Mean Anomaly in the third observation adde the double of *F c* to the True Auomaly *F S c.* and so by consequence the middle Motio either from the Aphelion or Æquinox is obtained in all the three observa tions.

But because it is found by diligent observations of the Planets true places especially of Mars in his oppositions to the Sun, that the Elliptick Æquatio

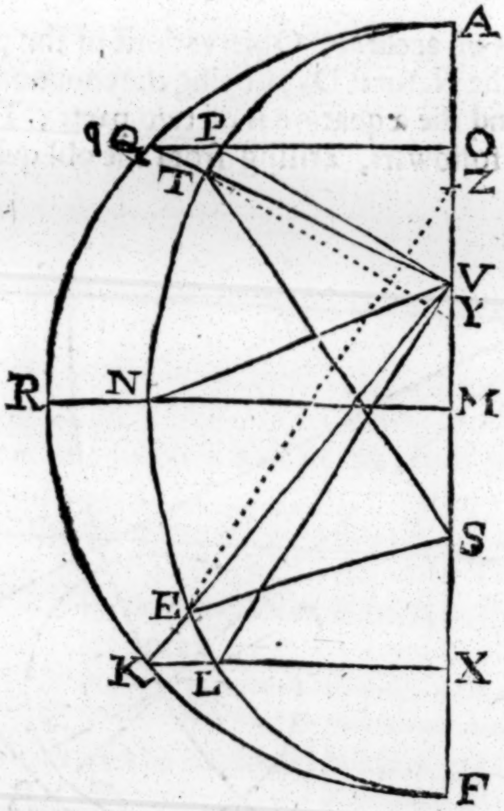
ere used requires correction, we have applyed an Angle at the Focus of mid-le motion, subtended by the part of the Ordinate line intercepted between eEllipsis and Circle circumscribing it, which Angle we call the Variation; he best demonstration whereof is this, which I had from my ingenious friend Ir *Robert Anderson.*

Let *A P N F* be supposed the semiellipsis, and the semicircle *A Q R F* de-ibed upon the extreams of the transverse diameter, the Ordinates *M N* and *P* being extended to *R* and *Q* in the periphery of the circle; then by the 21 *rop.* of the first of *Apollonius*,

$$MN : MR :: OP : OQ.$$

Therefore,

$$MN : MR :: tan.\, OVP : tan.\, OVQ.$$



But to finde *M N* the Conjugate semidiameter of the Ellipsis, In the right ngled triangle *M N V*, *N V* the hypotenuse (equal to *M R*, or *M A* the ransverse semidiamiter) and the side *M V* (equall to the Eccentricity) being iven, (by the 47. of the 1. *Elem.*) the square root of the difference of their quares is *M N*.

And

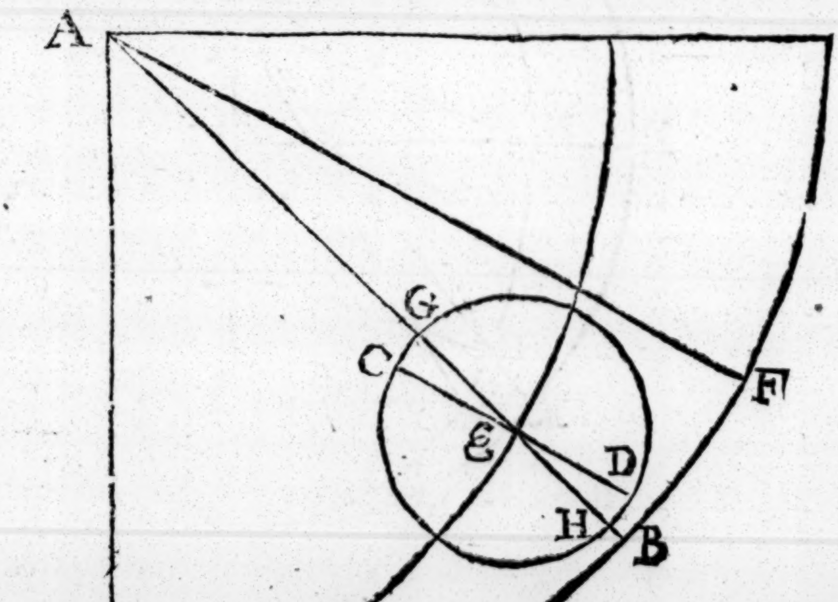
And suppofing the Angle *A V P* the mean Anomaly, *A V Q* shall be Corrected Anomaly, *P V Q* the variation, *T* the place of the Planet in the lipsis, and *V T S* the Elliptick æquation: Then drawing the pricked line parallell to *V P* the line of Middle Motion, *Y T S* shall be the Absolute æq tion.

Or let *A V L* be the Mean Anomaly, *A V K* is the Corrected Anom *L V K* the variation, *E* the place of the Planet, *V E S* the Elliptick æquat and (*E Z* being parallell to *V L*) *Z E S* the Absolute æquation.

So that in the first and fourth quadrants of mean Anomaly the variation minisheth, but in the second and third quadrants it increaseth the æquatio the Planet.

Of the Æquation of Time.

BY the cõstant series of accurate Observations of the places and Ecli of the Luminaries, the Natural Days (being the common measure of Ti are proved unequall; and the æquation is of two parts; That which is en teined by *Tycho* and his followers, arising from the obliquity of the Eclipt we thus demonstrate,



Let *A* be the Center of the Sun, *E* the Center of the Earth, ♎ *E* the Earths Longitude from the Æquinoctial point in the Ecliptick, ♎ *F* the like arch projected in the Æquator, ♎ *B* the right Ascension of the Earths or Suns true place, *G H* is a diameter of the Æquinoctial and Meridian of the Earths apparent diurnal revolution, *A B* the semidiameter of the true Meridian and Æquinoctial supposed in the Heavens, and *G H* parallel to *A B* (though here they appeare as one right line; Then let *C D* parallel to *A F* be likewise a diameter of the Æquinoctiall and Meridian of the mean or equall revolution. Hence *C E G* the angle of the Earths Libration is equall to *B A F* the difference of Longitude and Right Ascension.
And this is the first part of our Æquation of Time.

The second part is from the Annuall Inequality (whence the Earth being in her Aphelion her diurnall revolution is slowest, in her Perihelion swiftest) and is alwaies equall to the Earths Annuall Æquation, which converted into time there needs no farther Demonstration of it.

And the summe or difference of these two parts is the Absolute Æquation of Time.

Of the Præcession of the Æquinox.

BY comparing Antient Observations with Moderne, the Fixt Starres Longitudes from the Æquinoctiall points are alwaies found increasing, which (without manifest absurdity) can be determined no otherwise then by the Præcession of the Earths Æquinoctiall: and it is not unlikely but the revolution of the Suns vortex (having most efficacie upon the point of the Earth which is next the Sun) is the principall cause of this slow revolution of the Earth upon her movable Eclipticall Poles contrary to the succession of the signes, as well as of the Annuall revolutions of all the Planets in due proportion to their distances; and their diurnall revolutions being more peculiar to themselves, are yet remitted and intended by their greater and lesser distance from the Sun.

But this Motion of Præcession may be compared to that of a wheele, which by the revolution of the vortex, as of an other wheele gently touching its circumference, is slowly turned the contrary way.

And here observe that the Ecliptick and its Poles are fixt in the Heavens (though movable in the Earth) so that the Fixt starres Latitudes are alwayes the same without any alteration;

But

But the Æquinoctiall with the Poles thereof are fixed in the Earth and movable in the Heavens, as the Præcession of the Æquinox demonstrates. And the Inclination of the Æquinoctiall to the Ecliptick, or the distance of their Poles is invariable and constant in all Ages, as by some select and more certaine observations will easily appeare.

Timocharis (as *Ptolomy* hath it in his *Almagest*) sets down the Virgins Spike more Northerly then the Æquinoctiall 1°. 24'. the year when it was so observed is unknown, but conjectured much about 300 yeares before Christ.

By the given declination North 1°. 24'. the Latitude South 2°. and the Obliquity of the Ecliptick 23°. 30'. the Longitude of the starre is ♍. 21°. 51'. but by the observation of Tycho *A.C.* 1601 Current ♎ 18°. 15'. whence the Præcession is in 1900 years 26°. 24'. and in one year 50". But if the observation were made by the amplitude of the Starre in the Horizon (which is as like as not) then (by reason of refraction) the true Longitude in the first observation is augmented and the motion of Præcession diminished.

In the Persian Tables rectified to the year of Christ, 1115. the Place of Spica is ♎ 11°.40'. whence to the time of Tycho in 486 years the motion is. 6°.35'. and the *Annuall* Præcession 48". 46"'.

In the same Persian Tables, the last starre in Pegasus wing is in ♓ 27 . 10'. but by the observation of Tycho, 1601. ♈. 3° 37'. whence the Præcession in 486 years is. 6°.27'. and in one year 47" 47"'.

We have also considered many other Observations Old and New; but in regard the more ancient Astronomers were destitute of convenient Instruments (as is evident by the discrepancy of their observations and by their manifest error in the greatest declination of the Sun (which is more easily observed then the declinations of the fixt starres) and because the error of 24' in declination amounts at least to one whole degree in Longitude; we have therefore (for want of better observations) made choice of some such applications of the Moon and Planets to Fixt starres (related by *Ptolomy*) as have most probability of truth, and comparing them with some other, limited the constant Annuall Præcession of the Æquinox 48". the motion in 100 yeares 1° 20'. and one whole revolution thereof in 27000 yeares.

The

The true place of the Earths Aphelion *with her Eccentricity and Middle motion determined.*

THe Aphelions and Foci of the Middle motions of the Primary Planets are (as well as the Centers of the Sun and Fixt-Starres) Immovable, the augmentation of their Longitudes being only the Præcession of the Æquinox; and that this is not barely the opinion of my selfe & some others, the Observations which shall be produced in their convenient place will sufficiently demonstrate; and hence the Sidereall years are alwaies equall, but the Tropical yeares unequall.

Now by the method before used (but accounting the Earths longitudes from the Fixt starres, and correcting the intervalls of Middle motion by Variaton and by the Æquation of Time) and otherwise by comparing many observations together, we find the Constant Longitude of the Earths Aphelion from the first starre of Aries 8s. 8°. 20′. Her Eccentricity 1732 such parts as her mean distance from the Sun is 100000. and by the observation of *Tycho* 1590 *March* the 11th in the Meridian of *Vraniburg*, to the equall Time reduced to the Meridian of *London*, being *March* the 10th day 23h. 2′. we determine the Earths Mean Anomaly thus.

	s	°	′	″
The Place of the Sun observed	♈	0	33	19
The Præcession of the Equinox	0	27	27	22
The Sidereall Longitude of the Earth	5	3	5	57
The Place of the Aphelion	8	8	20	0
The True Anomaly of the Earth	8	24	45	57
The Absolute Æquation substract		1	58	27
The Mean Anomaly	8	22	47	30

Then for the Middle Motion in distinct intervalls of Time, we gather in like manner the mean Anomaly of the Earth to the best ancient observations of both Equinoxes; and from those of *Hipparchus* and *Albategnius* to *Tycho*, we limit the motion of the Earths mean Anomaly answerable to 20 Julian years 19 revolutions 11 signes 29 degrees 53 minutes 1 second. And hence the true length of the Sidereall yeare is 365 dayes 6 houres 8 minutes 30 seconds, and the mean length of the Tropicall yeare 365 dayes 5 houres 49 minutes 1 second.

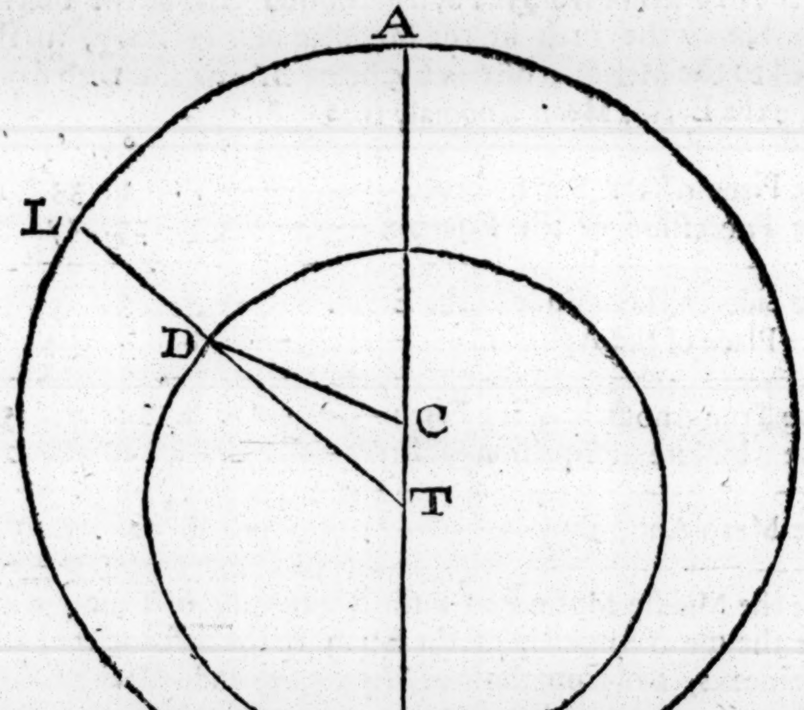
Of

Of the Theorie *of the Moon.*

THe Theorie of the motion of this ſecondary Planet about the Earth differs in all reſpects from that of the primary Planets about the Sun, as well in her Eccentricity as her various Motions and Inequalities.

Now by the generall conſent of the moſt exact obſervations of *Gaſſendus*, *Langrenus*, *Ricciolus* and *Hevelius*, carefully made with the Teleſcope and otherwaies, the Moon being in ☌ or ☍ to the Sun, the difference of her Apogæon and Perigæon diameter is proved ſomwhat more then 4′, and by thoſe of *Hevelius* in Solar Eclipſes (with due conſideration of the Moons altitude in each obſervation) we determine the Apogæon diameter of the New or Full Moon in the Horizon. 28′. $\frac{2}{3}$ ferè. and her Perigæon diameter in the like poſition 33′. and hence her Eccentricity is neer upon 71 ſuch parts as her mean diſtance from the Earth is 1000. for demonſtration of which Eccentricity together with the firſt Inequality of the Moon;

Let the Circle *A L P* denote the Eccentrick, the Center thereof *C* the point to which the Middle-motion is referred, *T* the Center of the Earth, the concentrick leſſer Circle the Æquant, *C T* the Eccentricity.



And let *A T* the Apogæon distance, *T P* the Perigæon distance, and *D T* the semidiameter of the Æquant, be in continual proportion. Then supposing the Moon in *L*, the right line *T L* cutting the Æquant in *D*, the Angle *A C D* shall be the Mean Anomaly, *C D T* the Æquation, and *A T D* the true Anomaly.

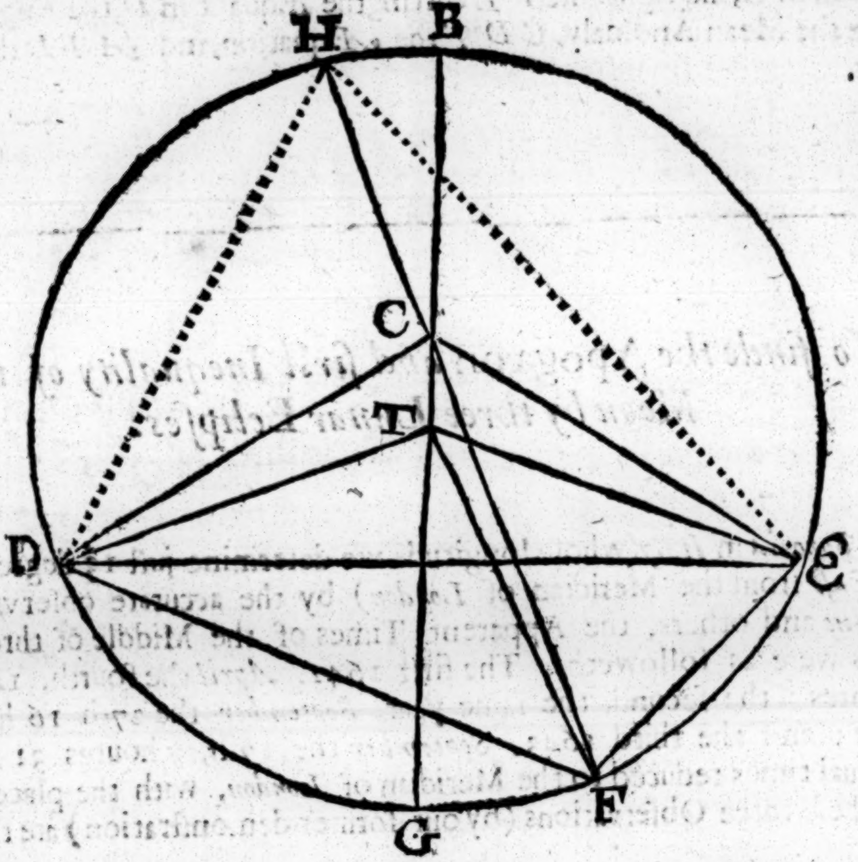
To finde the Apogæon *and first Inequality of the Moon by three Lunar Eclipses.*

AT *Bononia* in *Italy* (whose longitude we determine just 13 degrees to the *East* from the Meridian of *London*) by the accurate observations of *Ricciolus* and others, the Apparent Times of the Middle of three Lunar Eclipses were as followeth. The first 1642. *April* the fourth, 14 houres 44 minutes; the second, the same year, *September* the 27th 16 houres 46 minutes; and the third 1643. *September* the 17th, 7 houres 31 minutes. The Equal times reduced to the Meridian of *London*, with the places of the Sun in these three Observations (by our former demonstration) are thus.

Anno.	*Mens.*	die.	ho.	′	S.	°	′	″
1642.	*April.*	4	13	37	♈	25	6	54
1642.	*Sept.*	27	15	57	♎	14	50	9
1643.	*Sept.*	17	6	46	♎	4	20	20

Hence the place of the Moon in the first Observation is ♎ 25° 6′ 54″ in the second ♈ 14° 50′ 9″ in the third ♈ 4° 20′ 20″.

Then let the Circle *B H D G F E* denote the Moons Æquant, *T* the Center of the Earth, the semidiameters *T D*, *T E* and *T F* the apparent places of the Moon in the first, second and third Observations, *C* the Center of the Eccentrick, *C D*, *C E*, *C F* the lines of Middle Motion.



From the first Observation to the second are 176 days, 2 hours, 20′.

The true Motion of the Moon.	169°	43′	15′
The Motion of the *Apogæon* substract.	19	37	8
The Motion of the True Anomaly is the Arch *D E*.	150	6	7
The Motion of the Mean Anomaly (rejecting Circles) *D C E*	140	42	28

From the first Observation to the third are 530 days, 17 houres, 9′.

The True Motion of the Moon.	159°	13′	26′
The Motion of the *Apogæon* substract.	59	7	32
The Motion of the True Anomaly is the Arch *D F*.	100	5	54
The Motion of the Mean Anomaly the Angle *D C F*	93	46	43

There-

Therefore the Arch *F E* is ———————————— 50° 0′ 13″
And the Angle *F C E.* ———————————— 46 55 45

Then suppose the Logarithm of *D C* 10.000000. Continue *F C* to *H*, and with the other right lines compleat the Diagram.

1. In the Triangle *D C H* are given *D C H* the Complement of *D C F* to a semicircle. *D H C* the half of *D T F* the Angle at the Center and *D C* as above. Required *C H.*

D H C.	50°	2′	57″. sin.		9.884566
H D C.	43	43	46. sin.	+ *D C*	19.839638
C H.					9.955072

2. In the Triangle *H C E* are given *C H, C H E* the half of *F T E, H C E* the Complement of *F C E.* Required *C E.*

C E H.	21°	55′	38″. sin.	9.572208
C H E.	25	0	6. sin.	9.625975
C H.				9.955072
				19.581047
C E.				10.008839

3. In the Triangle *D C E* are given *D C, C E, D C E.* Required *C E D, D E.*

C E + rad: — *D C.*				
	45°	34′	59″. tan.	10.008839
Rad:	0	34	59. tan.	8.007602
	19	38	46. tan.	9.552657
	0	12	29. tan.	7.560259
C E D.	19	26	17. sin.	9.522167
D C E.	140	42	28. sin. + *D C.*	19.801593
D E.				10.279426

4. In the Isosceles Triangle *D T E* are given *D E, D T E.* Required *D T.* And from the Angle *C D E* substract *T D E*, there is left *C D T.*

D T E.	150°	06′	07″. sin.	9.697629
D E T.	14	56	56. sin.	9.411548
D E.				10.279426
				19.690974
D T.				9.993345

5. In

5. In the Triangle CDT are given DC, DT, CDT. Required CTD, CT.

DC. + rad.				20. 000000
DT.				9. 993345
	45°	26′	20″. tan.	10. 006655
Rad.	0	26	20. tan.	7. 884240
	87	32	50. tan.	11. 368199
	10	8	20. tan.	9. 252439
CTD.	97	41	10. sin.	9. 996081
CDT.	4	59	19. sin. + rad.	18. 932010
CT.				8. 935929

	S	°	′	″
The Place of the Moon in the first Observation.	6	25	6	54
The True Anomaly CTD substract.	3	7	41	10
The Place of the Apogæon.	3	17	25	44
The Æquation CDT. Adde.	0	4	54	19
The midde Longitude of the Moon.	7	0	1	13
The Mean Anomaly BCD.	3	12	35	29

And for the Eccentricity in such parts as the Radius of the Æquant is 100000. make this proportion.

DT.	9. 993345
CT.	8. 935929
100000	5. 000000
8762	3. 924584

But by these and many other Eclipses as well Solar as Lunar, (with respect to the Moons reduction) we limit the longitude of the Apogæon more, and the Mean Anomaly less by about 21′, and supposing DT 100000. we have stated C T 8765. of the same parts.

Then, In three continual Proportionals, the Lesser Extreme with the difference of the Mean and Greater Extreme being given, to find the Mean, &c. My much esteemed Friend Mr *Robert Anderson* doth it thus.

Let there be three numbers B, C, A. Let B be equal to the Lesser Extreme, C the difference of the Mean and Greater Extreme, and A the Mean.

Then

Then $A + C$ is the Greater Extreme, which multiplied by B, the product is $AB + CB$ (by the 20. of the 7.) equal to the square of A, the Æquation $AA = AB + CB$. And for the resolution, To the square of half B add the multiplex of C in B, and to the square root of the summe add the half of B, It shall be equal to the Mean Proportional.

Now in the first of the two preceding Diagrams, the Lesser Extreme D T being supposed 100000. the difference of the Mean T P and the Greater Extreme AT is the double of C T. 17530. and hence (by the work) TP is 115211. to which adding C T. 8765. the summe is CP. 123976. the semidiameter of the Moons Eccentrick, or her mean distance from the Earth.

But in such parts as the mean distance is 100000. the *Eccentricity* is 7070. the Apogæon distance 107070. the Perigæon distance 92930. and the semidiameter of the Æquant 80657.

Of the second Inequality of the Moon.

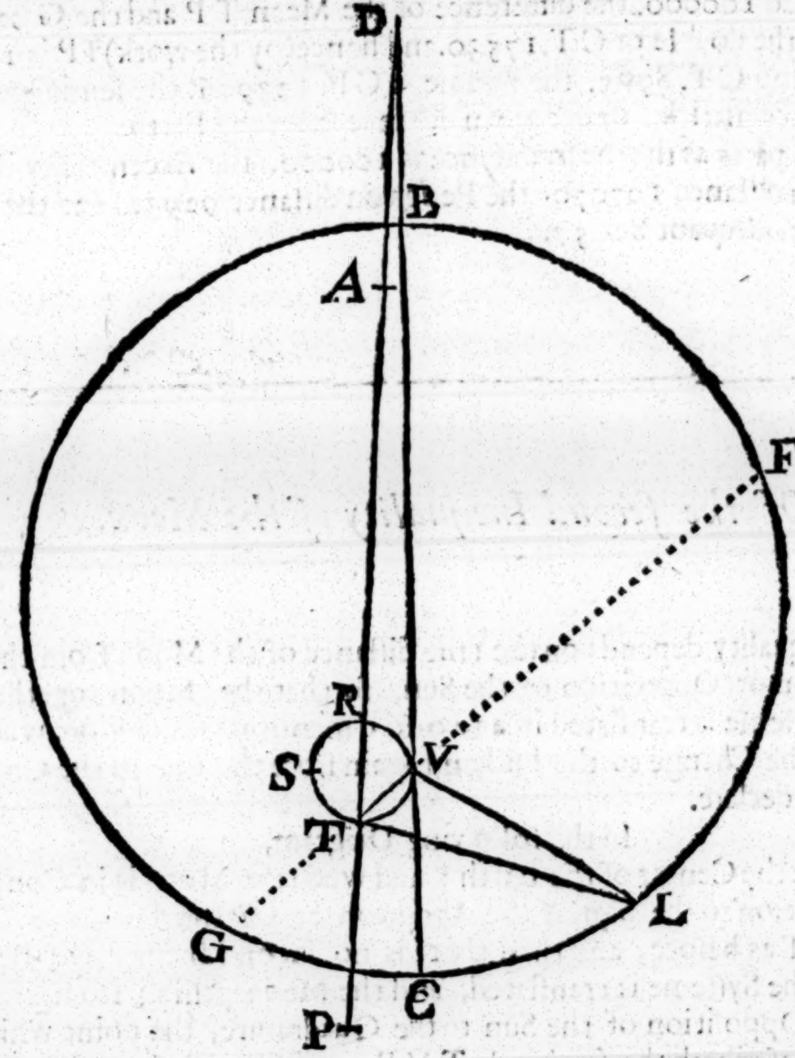
THis Inequality depends on the true distance of the Moon from the Conjunction or Opposition of the Sun, so that the Moon together with her whole Systeme is translated in a two-fold menstrual revolution, whose period is from the Change to the Full, and again from the Full to the Change, as we shall here declare.

In the following Diagram,

Let T denote the Center of the Earth; and when the Moon is in Conjunction or Opposition to the Sun, *A* the Apogæon and *P* the Perigæon shall be distant from T as before, and then there is no second Inequality; but at all other times the Systeme is translated, and the Moon passing from the Conjunction or Opposition of the Sun to the Quadrature, the point which was before in T describeth the semicircle T V R, and likewise from the Quadrature to the Conjunction or Opposition the other semicircle R S T; the motion of the said point being always double to the true first æquated Motion of the Moon from the Sun.

Now

Now in the removed Systeme, Let the Arch T V of the little Circle be equal to the double distance of the Moon from the Conjunction or Opposition of the Sun, the Chord T V extended to F and G, the Moon placed in L,



B V L the complement of the true Anomaly, V B equal to T A and V L to the distance of the *Moon* from the Earth in the untranslated Systeme; Continue V B and T A, let them meet at D and let V D be of a constant known proportion. Then shall F V L denote the Complement of the Synodical Anomaly

Anomaly, V L T the Evection, T D V the Reflection, T L the true place and distance of the Moon from the Earth.

And in this example, the summe of the Evection and Reflection (because they both add) is the absolute Secondary Æquation, and so if they both substract; but otherwise, if the one adde and the other substract its their difference.

The greatest Angle of Evection subtended by the diameter R T in the Quadratures is according to our most expert modern Astronomers about 2°.30'. or half the first Inequality, and the greatest Reflection in the Octants by *Tycho* and *Bullialdus*. 40'. 30". But before we come to determine the just proportion of either, it will not be impertinent to our purpose to make some inquisition

Concerning the Moons Parallax.

Anno 1639. *May* the 22th. 6 ho. 10'. 27". was the Apparent Time of the end of a Solar Eclipse observed at *London*. the Equal Time is 6 ho. 0'. 37". the True place of the Sun. ♊ 10°. 49'. 28", and by our ultimate correction,

	s	°	'	''
The mean Anomaly of the Moon.	2.	25.	59.	55
The Æquation substract.	0.	5.	0.	59
The True Anomaly:	2.	20.	58.	56
The Apogæon	11.	20.	59.	30
The Place of the Moon first Æquated	2.	11.	58.	26
Distance of the Moon from the Sun	0.	1.	8.	58

Hence (by the best computations) the secondary Æquation is nerest 1°, and the reduction (the Moon being 7° in antecedence from ☊) 1'.35". both to be added, and so the true place of the Moon in the Ecliptick is ♊.12°. 1'. her true distance from the Sun 1°. 11'. 32".

The Semidiameter of the Sun (as we gather by the Observations of *Hevelius* and others) is 15'.40". the Semidiameter of the Moon (according to her Anomaly and Altitude) 15'. 17". the Aggregate of Semidiametets. 30'. 57". which (because the Visible Latitude of the Moon was then little or nothing) is the observed distance of the Moon from the Sun in Longitude, but the true distance was. 1°. 11'. 32". and therefore the Parallax of the Moon from the Sun in Longitude 40'. 35".

The distance of the Sun from the Vertex was. 74°. 25'. the Angle of the Verticall circle with the Ecliptick 41°. 48'. which gives the Parallax of the Moon from the Sun in Altitude. 54'. 26". the Parallax of the Sun 14" added,

the Parallax of the Moon in Altitude is 54′. 40″. and hence the Semidiameter of the Earth will be 1665 such parts as the mean distance of the Moon is 100000.

Otherwise in finding the proportion of the Earths semidiameter or subtense of the Moons Parallax by the observed duration and digit of a Lunar Eclipse, the inequality and inconstancy of the Earths shadow, with the uncertain limits of the Umbra and Penumbra are considerable impediments; and therefore to obtain the true Parallax of the Moon, with the place of her Nodes, we have compared several exact Telescope-observations of her visible Latitudes in Solar Eclipses, with some centrall conjunctions of the Luminaries; and finally, to the mean distance of the Moon from the Earth 100000. We have stated the Earths semidiameter. 1650. of which, with the Moons Latitude, we shall anon give a farther account.

For the Evection of the Moon in the Quadratures.

LOngomontanus in *Lib.* 1. *Theoric. Cap.6.* relates a notable conjunction of the Moon with Aldebaran or the Southern Eye of the Bull, observed at *Hafnia* in *Denmark Anno* 1608 *Febr:* the 12th day. 8h. 43′. *T. A.* at *Wittenberg* in *Saxony* 8 h. 46′. he also computes the Moons true Altitude 39°. 45′ and her visible altitude at *Hafnia* when the upper horne of the Moon appeared in the same Longitude and Latitude with the starre about 39°. and hence the Apparent time ought to be 8h. 36′. but the æquall time at *London* 7h. 48′. The true place of the Sun was then by our Tables, ♓ 3°. 38′. 6″. the mean Anomaly of the Moon 8s. 18°. 41′. 34″. the place of the Moon first Æquated. ♊. 2°. 7′. 30″. her distance from the Sun 2s. 28°. 29′. 24″. The place of the starre ♊ 4°. 17′. 12″. with Latitude South 5°. 30′. distance from the vertex of *Hafnia* 50°. 53′. angle of the Verticall with the Circle of Latitude 38°. 58′. the Parallax of the upper horne of the *Moon* in altitude. 44′. 35″. in Longitude. 28′. 9″. in Latitude. 34′. 40″. therefore the true place of the *Moon* observed, ♊. 4°. 45′. 21″. the argument of Latitude was 9s. 11°. *ferè*, the reduction substract 2′. 45″. the place of the *Moon* in her orbite ♊ 4°. 42′. 36″. from which substract her place first æquated ♊. 2°. 7′. 30″. there remaines the whole second inæquality 2°. 35′. 6″. and because the first æquated Place of the *Moon* wanted 1°. 30′ 36″ of the Quadrature, the Reflection was. 2′. and the angle of Evection. 2°. 33′. 6″. but supposing the time of the observation 8h. 43′. (as above) the Evection will be found lesse by about. 3′. but comparing this with many other exact observations we thus conclude:

The

The Quantity of the Evection and Reflection limited.

THe Eccentricity of the Moon in Conjunction or Opposition to the Sun being (by the 11th of the 2.) cut according to Extreme and mean proportion, the greater segment shall be the diameter of the Circle of Evection.

Now supposing the semidiameter of the Moons Eccentrick, 100000. we have determined the Eccentricity in the New and Full Moons 7070. the square thereof is. 49984900. the half of 7070. is 3535. squared. 12496225. the summe of the squares. 62481125. the square root of the summe is neerest. 7904 $\frac{1}{2}$ from which substract. 3535. there is left. 4369. $\frac{1}{2}$ which in the last Diagram denotes *T R* the diameter of the little Circle. and hence in the observation last mentioned the angle of Evection is. 2°. 31′. 40″. but the greatest Evection in the Quadratures. 2°. 30′. 16″. And in the same Diagram (by *Tycho's* observations of the Moons place in the 90th degree of the Ecliptick, with several applications to Fixt starres observed since with the Telescope) in the triangle *V D T* we state the constant side *V D* equall to *A P* or *B E* the diameter of the Eccentrick, and therefore the greatest Reflection. 37′. 33″. in the Octants.

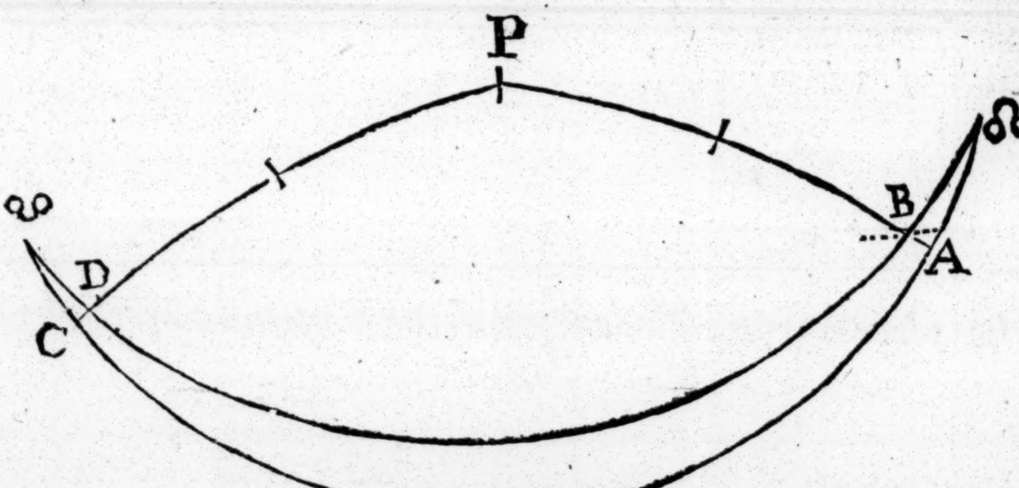
The place of the Nodes with the Latitude of the Moon defined.

ANno 1652 *March* the 28th day 22 h. 30′. was the Apparent Time of a visible Conjunction of the Luminaries observed at *London*, the digits of the Sun Eclipsed were 11 or some thing more on the *North* part, at *Paris* by some observations which wee count neerest truth, almost 10$\frac{1}{2}$. and therefore at *London*, as neer as wee can gather 11 dig: 18. min. the Equall Time was 22 h. 16′. the place of the Sun ♈. 19°. 11′. 33″. his distance from the Vertex 47°. 41′. the Angle of the Vertical circle with the Ecliptick 86°. 25′. the mean Anomaly of the Moon. 7^s. 11°. 53′. 48″. the semidiameter of the Sun 15′. 52″. of the Moon 16′. 21″. the Aggregate 32′. 13″. which with the digits

digits 11.18′ gives the Latitude of the Moon ſeen. 2.′20″.but ſuppoſing t
ſemidiameter of the Earth 1650 parts as before, the parallax of the Mo
from the Sun was in altitude 44′.0″. in Longitude 2′. 45″. in Latitude 4
55″. and hence the true place of the Moon. ♈. 19°.14′.18″ with Latitu
North, 46′.15″.

Anno 1654. *Auguſt* the 1 day. 21 h. 4 ½′ *T. A.* by obſervation was t
middle of an other Solar Eclipſe at *London*. the Equall Time was 21
19.½′. the place of the Sun ♌. 19°. 33′. 38″. his diſtance from the Ver
50°.32′. the Angle of the Verticall circle with the Ecliptick 37°. 43′. t
mean Anomaly of the Moon 8ˢ.5°.0′. 47″. the ſemidiameter of the Sun 1
43″.of the Moon 15′.56″. the aggregate 31′.39″. and by comparing ſe
rall obſervations we determine the digits Eclipſed 10. 16′.and hence t
Latitude of the Moon ſeen 4′.45″. North. but her parallax from the S
was in altitude 44′. 48″. in Longitude. 35′ 26″. in Latitude. 27′.25″. a
therefore the true place of the Moon ♌ 18°.58′. 12″. with Latitude No
32′.10″.

From the firſt obſervation to the ſecond, the difference of the Moons tr
Longitude is 119°. 43′. 54″. the true motion of the Nodes in the Inte
vall 45°.17′.10″. to be added, the ſumme is the Angle *B P D*. 165°. 1′.



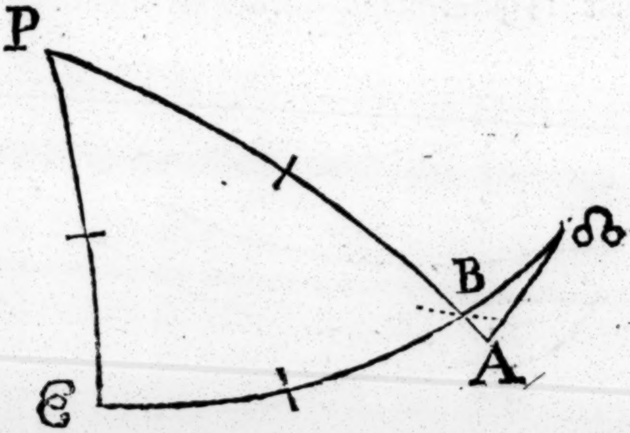
alſo the Complement of the Moons Latitude in the firſt obſervation is *B*
89°. 13′. 45″. in the ſecond *D P*. 89°. 27′. 50″. by which three terme
in the Triangle *B P D*. there is given my operation *P B D*. 85°. 3′. 30
and in the Triangle *B A* ☊. by the right angle at *A* with *A B* ☊ equall t
PBD. 85°.3′. 30″. and *A B*.46′.15″. the Latitude in the firſt obſervation
☊ *A* is 8°. 50′.38″. the Longitude of the Moon from the aſcending Node

nd *A* ☊ *B*. 5°. 0′. 5″. the Angle of her Orbite with the Ecliptick. Then from the first observed place of the Moon ♈. 19°. 14′. 18″. substract ☊ *A*. 8°. 50′. 38″. there remaines the true place of ☊. ♈. 10°. 23′. 40″. but we shall examine the quantity of the angle *A* ☊ *B* by one greater Latitude.

Anno 1645. the night following the last day of *Aprill*, at *Bononia* in *Italy*, *Ricciolus* observed the visible meridionall distance of the Moons center from the vertex, corrected by his refraction 58°. 53′. whence the distance from the vertex seen was 58°. 51¾′. wherein we allow no sensible refraction.

The exact time of the Moons coming to the Meridian of *Bononia* was 12 h. 14′. *fere*. the equall time at *London* 11 h. 6′. The place of the Sun by our Tables. ♉. 20°. 27′. 38″. the mean Anomaly of the Moon 11s. 29°. 47′. 27″. her true Longitude in her Orbite. 7s. 22°. 32′. 22″. reduced to the Ecliptick 7s. 22°. 32′. 3″. her parallax in altitude at *Bononia* 45′. 21″. the Latitude of the place by the observation of *Ricciolus* 44°. 29′. 30″. therefore the declination of the Moon south 13°. 36′. 54″. which with her true place gives her Latitude North 4°. 59′. 53″.

But *Anno*. 1652. *March* 28th day 22 h. 16′. *T. M.* at *London*, the place of the Moon in her orbite was 0s. 19°. 16′. 19″. with Latitude North 46′. 15″. the difference of Longitudes in the orbite 213°. 16′. 3″. the Æquated motion of the Nodes in the intervall substract 133°. 33′. 38″. there is left *E B* in the Moons orbite. 79°. 42′. 25″.



And the Complements of Latitudes are *E P*. 85°. 0′. 7″. and *P B*. 89°. 13′. 45″. by which three sides we find the Angle *P B E* equall to *A B* ☋ 85°. 3′. 36″. and hence in the Triangle *A B* ☊ with the side *A B* 46′. 15″.

and

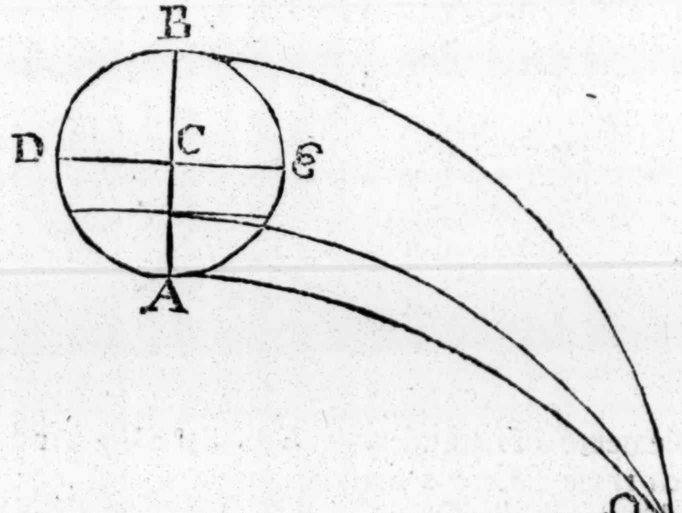
and the right angle *B A* ☊. Hypotenuse ☊ *B* is 8°. 52'. 49". the a[rgu]ment of Latitude, or the distance of the Moon from ☊ the side ☊ A. 8°. [..] 49". her distance reduced to the Ecliptick, and the angle A ☊ B 4°. 59'. [..] the Inclination of her Orbite.

By these with other Observations we determine the greatest Latitud[e in] the New or Full Moon exactly 5°. and the place of ☊ (without sens[ible] difference) as before.

Of the Excess of the Moons Latitude above 5 degrees.

IN the Observation of *Longomontanus*. 1608. *Febr*: the 12th &c: befo[re] mentioned, in regard it was made by the bare eye, we allow 1' or som[e]thing more for the dilatation of light, and conclude the visible Latitude [of] the Moon 5°. 47'. *ferè*, but her true Latitude corrected by parallax, [..] 12'. $\frac{1}{4}$. by which and the argument of Latitude. 9s. 10°. 54'. 39". her gre[a]test Latitude in the Quadratures is 5°. 18'.

Then let *A B* the diameter of the little circle A E B be the Chord [of] 18'. ☊ the place of the Node; ☊ A in the New and Full Moones, and [☊] B in the Quadratures are quadrants of the Moons Orbite.

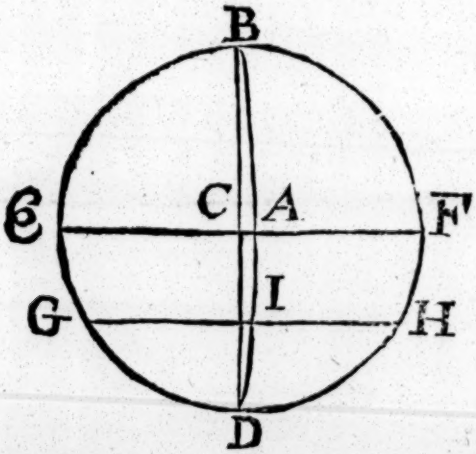


And

And for the greateſt Latitude at all times, account the double diſtance of the Moon (as in the Evection) from the conjunction or oppoſition of the Sun from A by E to B &c. a perpendicular falling thence upon A B gives the proportion, as the radius to CA or CB the ſine of 9′, ſo the co-ſine of the double diſtance of the Luminaries, to the ſine of the difference of Latitude from C; which in the upper ſemicircle E B D added, in the lower ſemicircle D A E ſubſtracted, to or from 5°, 9′. the Latitude of C, gives the greateſt Latitude of the Moon, or the Inclination of her Orbite at that time.

Of the Inequality of the Nodes.

TYcho by comparing many obſervations together, beſides the ſecond part of the ſecondary Æquation of the Moon, with the Exceſſe of her Latitude, which are ſufficiently proved, admits of a variation of about 9′ in Latitude neer the Nodes; which beſt agreeing with ſome Applications of the Moon to fixt ſtarres, obſerved ſince by *Gaſſendus* and *Bullialdus*, we thus eaſily demonſtrate in like manner as the Exceſſe.



Let the arch D A B be 3°. 30′. of the Eclipick, and the Chord thereof D B the diameter of the Circle B E D F, the other diameter E F cutting D B at right angles and the Ecliptick in A. Then numbring the double Motion of the Moon from the Sun (as before) from E by D to F to B and again to E

E; if it fall in E or F, the Node is in A and free from Inequality; but i
D or B, the Node is there with it, and then is the greatest æquation AI
or AB 1°. 45′. and in any other point (as G or H &c.) a Chord drawn
thence and parallal to EF shall cut the Ecliptick in the place of the Nod
and the arch intercepted (as A I) shall be the Æquation. Therefore, as th
radius to CD or CB the sine of 1°. 45. so the sine of the double distanc
of the Moon from the Sun, to the sine of the æquation; which in the forme
semicircle EDF sustracteth from, in the latter semicircle FBE addeth
the mean or Equal place of the Node.

The Middle Motions of the Moon determined.

THe method of finding the Apogæon with the mean Anomaly and plac
of the Nodes being already declared; to avoid tediousnesse, we sha
not here reiterate the work by ancient observations, but by as many as ar
extant of Lunar Eclipses, those especially of greatest antiquity, diligentl
compared amongst themselves and with moderne; in the space of 4 Julia
yeares or 1461 daies, we limit the mean Anomaly or middle-Motion of th
Moon from her Apogæon, 53 revolutions, 0 Sign, 7 degrees, 56 minutes
45 seconds; The Apogæon from the æquinox 5 Signs, 12 degrees, 46 mi-
nutes, 0 seconds; The Nodes retrogade, 2 signes, 17 degrees, 22 minutes
6 seconds, and the rest as in our Tables and former calculation.

Of the Primary Planets,

♄ ♃ ♂ ⊖ ♀ ☿.

The Proportion of their Orbes to the Periods of their Revolutions.

KEpler hath proposed the mean distances of Saturn, Jupiter, Mars, the Earth, Venus and Mercury from the Sun, in Sesquialter Proportion to the Periods of their Revolutions in Time; which though himself and some others since have not fully asserted in their Tables, yet with the Corrected Parallax of the Sun and Æquation of the Earth, it proves most consentaneous unto observation and altogether indubitable.

According to which proposition and our following methodicall limitation, the Periods of the Sidereall-Revolutions with the Mean-distances of these Planets from the Sun are thus.

	Revolutio. d	h	′	″	Dist. Med. à ⊙
♄	10759	6	36	26	953800
♃	4332	12	20	25	520110
♂	686	23	27	30	152369
⊖	365	6	8	30	100000
♀	224	16	49	24	72333
☿	87	23	15	53	38710

For Example, The Period of the Revolution of the Earth reduced into minutes of time, being 525968. ½. and of Mars. 989247. ½. I say, as the square of. 525968. ½. to the square of. 989247. ½. so the Cube of 100000. the mean distance of the Earth, to the Cube of 152369. the Mean distance of Mars. or by artificiall numbers,

⊖ 525968. ½.

525968 ½	*Log.* 5. 720960	*dupl.* 11. 441920	Proport.
989247 ½	*Log.* 5. 995305	*dupl.* 11. 990610	
100000	*Log.* 5. 000000	*tripl.* 15. 000000	
152369	*Log.* 5. 182897	*tripl.* 15. 548690	

And so of the rest. The like proportion is upon good grounds assigned to the four Satellites about *Jupiter*, in their secondary Revolutions and distances from him.

But otherwise to examine the proportion of the Orbes of the superior Planets to the Earths ; after our next following inquisition, it may be so easily performed by one observation of a Planet *extra situm Acronychium*, that we leave it to the Readers discretion ; and of the Inferiors, you have it in its proper place.

To find the Aphelions and Eccentricities of the three Superior Planets ♄ ♃ ♂.

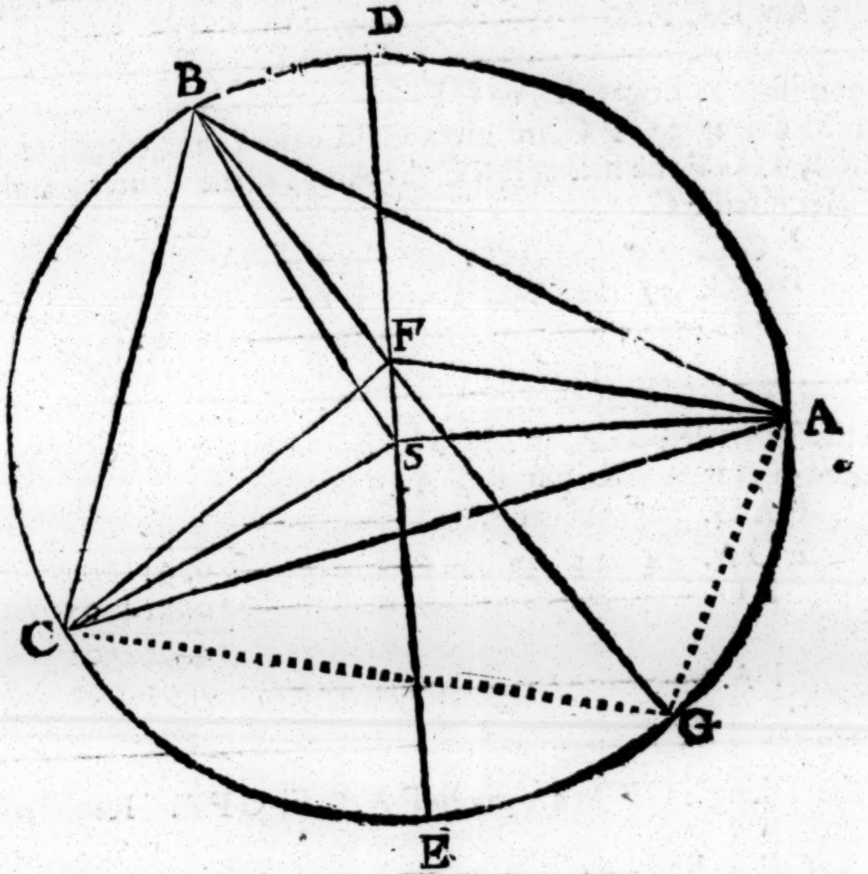
BY three Acronychial positures observed, the work is the same as in finding the Annual Inequality of the Earth, but for farther illustration thereof, take this example.

The Equal Times of three Oppositions of the *Sun* and *Mars* reduced to the meridian of *London*, with the Longitudes of *Mars* from the first Starre of *Aries*, by the accurate Observations of *Tycho Brahe* were these.

Anno.	*Mens.*	*die.*	*ho.*	′	S	°	′	″
1580.	*Nov.*	18	0	37	1	9	8	41
1587.	*Martii.*	6	6	27	4	28	17	45
1591.	*Junii.*	8	6	51	7	29	14	8

Let S denote the Center of the Sun, F the other Focus of *Mars*, the semidiameters of the Circle S A, S B, S C being equal to the transverse diameter of his Ellipsis and passing by his places in the first, second and third Observations, the right lines F A, F B, F C drawn, B F continued to G, and the Diagram compleated.

From



From the first Observation to the second,

	°	′	″
The Apparent motion of *Mars* is the Arch A B	109	9	4
The middle motion in the Interval (rejecting Circles)	124	52	59
The Summe	234	2	3
The half thereof is the Angle A F B	117	1	2

From the second Observation to the third,

	°	′	″
The Apparent motion of *Mars* is the Arch B C	90	56	23
The middle motion in the Interval	94	52	58
The Summe	185	49	21
The half thereof is the Angle B F C	92	54	40

	°	′	″
Therefore the Arch C A is	159	54	33
And the Angle C F A	150	4	18

Then supposing the Logarithm of C F ——— 10. 000000

1. In the Triangle C F G, are given C F G the Complement of B F C to a semicircle, C G F the half of B S C the Angle at the Center, and C F as above. Required F G.

F G C.	45°	28′	11″.	sin.	9. 853016
F C G.	47	26	29.	sin. + C F.	19. 867223
F G.					10. 014207

2. In the Triangle F G A, are given F G, F G A, the half of B S A, G F A complement of B F A. Required F A.

F A G.	62°	26′	30″.	sin.	9. 947698
F G A.	54	34	32.	sin.	9. 911094
F G.					10. 014207
					19. 925301
F A.					9. 977603

3. In the Triangle C F A, are given F A, C F, C F A. Required F A C C A.

C F + Rad.					20. 000000
F A					9. 977603
	46°	28′	36″.	tan.	10. 022397
Rad :	1	28	36.	tan.	8. 411256
: :	14	57	51.	tan.	9. 426965
:	0	23	41.	tan.	7. 838221
F A C.	15	21	32.	sin.	9. 423023
C F A.	150	4	18.	sin. + C F.	19. 698028
C A.					10. 275005

4. In the Isosceles *Triangle* C S A, are given C A, C S A. Required C S. And from the angle F C A substract S C A, there is left F C S.

C S A.

CSA. 20° 5′ 27″. sin. ———— 9.535929
SAC. 10 2 43. sin. ———— 9.241612
CA. ———— 10.275005
19.516617
CS. ———— 9.980678

5. In the Triangle FCS, are given CF, CS, FCS. Required FSC, FS.

CF + Rad. ———— 20.000000
CS. ———— 9.980678

46° 16′ 27″. tan. ———— 10.019322

Rad: 1 16 27. tan. ———— 8.347175
: : 87 44 17. tan. ———— 11.403415
: 29 23 3. tan. ———— 9.750590

FSC. 117 7 20. sin. ———— 9.949408
FCS. 4 31 27. sin. + CF. ———— 18.896964
FS. ———— 8.947556

	S	°	′	″
The Place of *Mars* in the third Observation ————	7	29	14	8
The true *Anomaly* F S C substract ————	3	27	7	20
Rests for the *Aphelion* ————	4	2	6	48
The æquation or double of F C S, adde to F S C ————	0	9	2	54
The summe is the mean Anomaly in the third Observation ————	4	6	10	14

And substracting the Intervals, the mean Anomaly in the second Observation is 1ˢ 1° 17′ 16″. in the first 8ˢ 26° 24′ 17″.

For the Eccentricity proport.

CS. ———— 9.980678
FS. ———— 8.947556
Mean dist. 152369 ———— 5.182897
Eccentricity. 14118 ———— 4.149775

And

And the ſquare root of the difference of the ſquares of the mean diſtance and Eccentricity is the Conjugate ſemidiameter of the Ellipſis 151714. *feri*, the Logarithm thereof 5. 181025.

Then as the Conjugate ſemidiameter, to the mean diſtance, or Tranſverſe ſemidiameter, ſo the Tangents of mean Anomaly, to the Tangents of correct Anomaly; whence, in the firſt Obſervation, the Anomaly correct by variation is 8^s $26°$ $25'$ $13''$. In the ſecond 1^s $1°$ $23'$ $41''$. In the third 4^s $6°$ $3'$ $10''$.

Therefore, applying the Intervals of correct Anomaly as before of middle motion it will be,

Arc.	°	′	″	*Ang:*	°	′	″
AB.	109	9	4	*AFB.*	117	3	46
BC.	90	56	23	*BFC.*	92	47	56
CA.	159	54	33	*CFA.*	150	8	18

With which Arches given at firſt, but corrected Angles, repeating the Work.

	S	°	′	″
The true Anomaly in the third Obſervation FSC is	3	27	55	37
The place of the Aphelion	4	1	18	31
The Elliptick Æquation, or double of FCS	0	8	56	58
The Variation	0	0	7	4
The abſolute Æquation	0	9	4	2
The Mean Anomaly	4	6	59	39

And the Eccentricity 14080. parts.

For

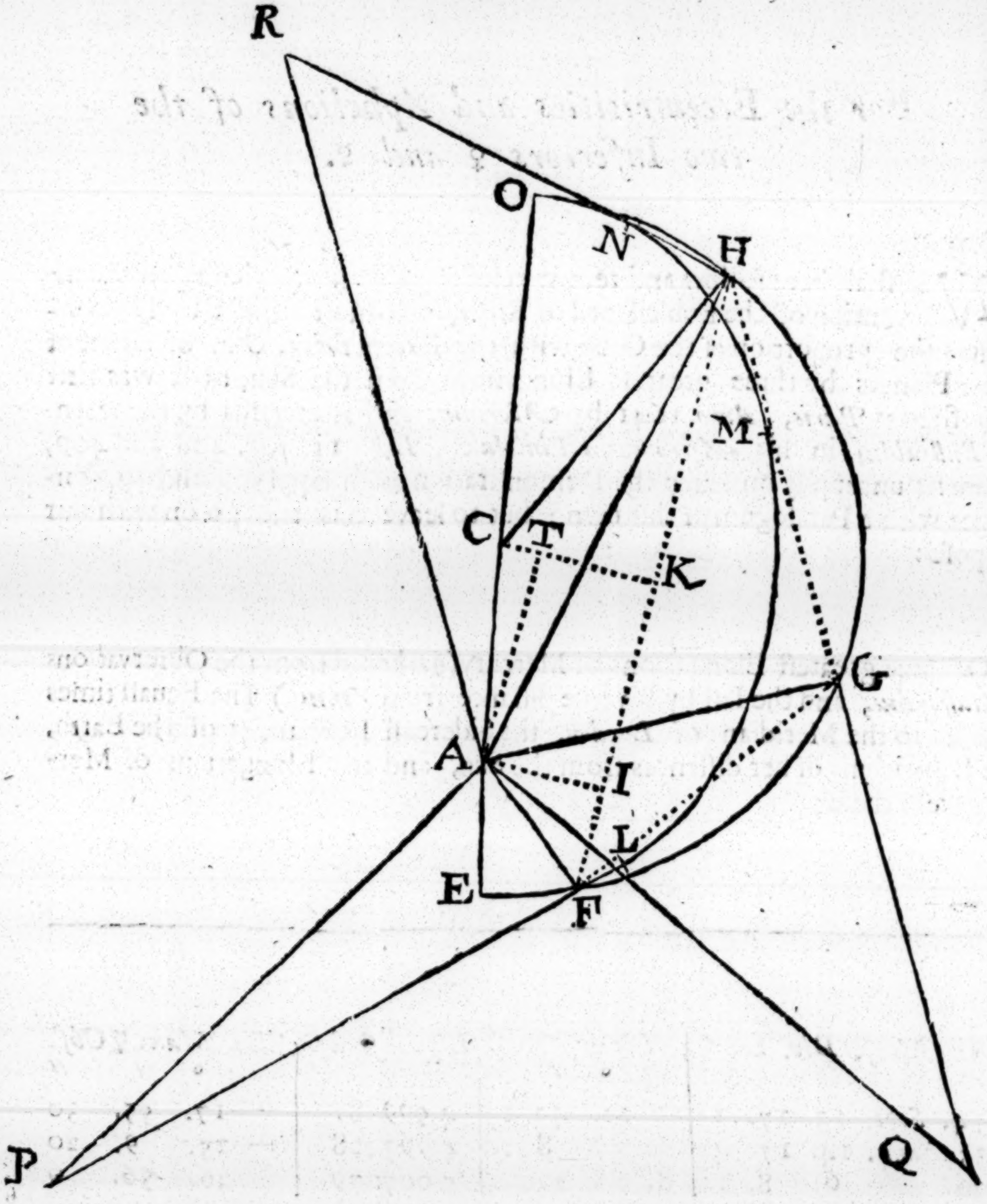
For the Eccentricities and Aphelions of the two Inferiors ♀ *and* ☿.

WE ſhall here follow and recommend to publick uſe the ingenious invention of the noble Lord of *Belna*, who moſt Artificially Demonſtrates the proportion of the Orbe with the Excentricity, *&c.* of either of theſe Planets by three greateſt Elongations from the Sun, as it was firſt publiſhed at *Paris*, *Anno* 1641 by *Morinus*, and afterwards by the learned *Bullialdus* in his *Aſtronomia Philolaica*, *Lib*. 11 *pag*. 408 and 409, where he unhappily miſtakes the Demonſtration as miſapplyed and ſo concludes with a Paralogiſm of his own ; but to leave this and go on with our purpoſe :

Of three greateſt Elongations of Mercury (gathered from the Obſervations of *Gaſſendus*, and the laſt by his true diſtance from *Venus*.) The Equall times reduced to the Meridian of *London*, the Sidereall Longitudes of the Earth, the Logarithms of her diſtances from the Sun, and the Elongations of Mercury were theſe ;

Anno.	*Menſ.*	*Die.*	*ho.*	′	*Locus.* ⊖. S	°	′	″	*Log. diſt. à* ☉	*Elon. Max.* ☿ *Obſ.* °	′	″
1634.	*Sept.*	23.	17.	15	11.	12.	49.	13	4.999281	—17.	55.	30
1635.	*Janu.*	14.	17.	48	3.	7.	8.	20	4.993328	—25.	9.	20
1636.	*Julij*	6.	8.	10	8.	26.	25.	5	5.007079	+. 26.	56.	0

Let



Let E M O be the Ellipsis of Mercury, O E the transverse Diameter, E G O the Circle circumscribed, C the Center, A the place of the Sun, and in the first, second and third Observations, Let P Q and R denote the places of the

the Earth, P A, Q A and R A her distances from the Sun; The right lines P L. Q M and R H Continging the Ellipsis (in the places of Mercury at L, M and N) and meeting with A F, A G and A H in the periphery of the Circle; P F A, Q G A and R H A shall be right Angles by the 49 prop. of the 3 of *Apollonius*.

Then upon the Chord *F H* letting fall the Perpendiculars *A I*, and *C K* equally dividing it in *K*, drawing *A T* parallell unto it, and compleating the Diagram, we thus proceed.

The difference of the Earths Longitudes in the first and second Observation is *PAQ* 114° 19′ 7″ in the second and third *Q A R* 169° 16′ 45″ also the Complement to a quadrant of the greatest Elongation of Mercury, is in the first Observation *PAF* 72° 4′ 30″. in the second *QAG* 64° 50′ 40″ in the third *R A H* 63° 4′ 0″.

	°	′	″		°	′	″
P A Q.	114	19	7	*Q A R.*	169	16	45
Q A G.	64	50	40	*Q A G.*	64	50	40
P A G.	179	9	47	*G A R.*	104	26	5
P A F.	72	4	30	*R A H.*	63	4	0
F A G.	107	5	17	*G A H.*	41	22	5

Rad. *P A.*		4.999281
A P F. 17° 55′ 30″ sin.		9.488229
A F.		4.487510

Rad. *Q A.*		4.993328
A Q G. 25 9 20 sin.		9.628468
A G.		4.621796

Rad. *R A.*		5.007079
A R H. 26 56 0 sin.		9.656054
A H.		4.663133

A H.		4.663133
A F.		4.487510
56 16 53. tan.		10.175623

Rad.

° ′ ″

Rad. 11 16 53. tan. ——— 9.299904
15 46 19 tan. ——— 9.450930
3 13 29 tan. ——— 8.750834

AFH. 18 59 48 sin. ——— 9.512569
AH. ——— 4.663133
HAF. 148 27 22 sin. ——— 9.718628
14.381761
HF. 73993 ——— 4.869192

AH. ——— 4.663133
AG. ——— 4.621796
47 43 22 tan. ——— 10.041337

Rad. 2 43 22 tan. ——— 8.677217
69 18 57 tan. ——— 10.423022
7 10 45 tan. ——— 9.100239

AGH. 76 29 42 sin. ——— 9.987822
AH. ——— 4.663133
GAH. 41 22 5 sin. ——— 9.820132
14.483265
GH. 31293 ——— 4.495443

AG. ——— 4.621796
AF. ——— 4.487510
53° 43′ 13″ tan. ——— 10.134286

Rad. 8 43 13 tan. ——— 9.185779
36 27 21 tan. ——— 9.868509
6 27 54 tan. ——— 9.054288

AFG

AFG. 42° 55′ 15″ sin. — 9.833139
AG. — 4,621796
FAG. 107 5 17 sin. — 9.980392
14.602188
FG. 587566 — 4.769049

HF. 73993
GH. 31293
FG. 58756
sum: 164042

$\frac{1}{2}$ — 82021 — 4.913925 } 8.818532
Diff. 1 — 8028 — 3.904607 }

2 — 50728 — 4.705248 } 29.071951
3 — 23265 — 4.366703 }

.20.253419
53° 14′ 32″ — tan. 10.126709

FGH. 106 29 4 sin. — 9.981772
KH. + Rad. — 14.568162
CH. 38582 — 4.586390

Rad. *CH*. — 4.586390
CHK. 16° 29′ 4″ sin. — 9.452944
CK. 10948 — 4.039334

Rad. *AF*. — 4.487510
AFI. 18 59 48 sin. — 9.512569
AI. 10002 — 4.000079
TC.. 946

Rad. *AF*. — 4.487510
FAI. 71 0 12 sin. — 9.975679
FI. 29053 — 4.463189
FK. 36997
IK. 7944 = *AT*:

	A T. 7944 ————————	3.900039
Rad.	*T C.* 946 ————————	12.975891
	T A C. 6° 47′ 28″ tan.	9.075852

	T A C. 6 47 28 sin. ———	9.072801
Rad.	*T C.* ————————	12.975891
	C A. 8000 ———————	3.903090

T A C. ——— 6° 47′ 28″
T A H. ——— 12 32 50 = *A H F*

C A H. —— 19 20 18
R A H. —— 63 4 0

R A O —— 43 43 42
R —— 266 25 5

O. —— 222 41 23

Hence the Semidiameter of the Orbe equal to the Mean distance of Merc is *C H.* 38582 ~~parts~~. The Eccentricity *C A.* 8000, and the Longitude of Aphelion in *O.* 7s 12° 41′ 23″.

But reducing the curtate distances to the true, and compa these with some most certain applications to fixt Stars and exactest Obse tions of *Gassendus* and others, to the mean distance of Mercury from Sun 38710 parts, We state his Eccentricity 7970. with the Sidereall p of his Aphelion 7s 13° 48′. and to this, his true place and middle Mo as followeth.

Anno 1631. *October* the 28th. day, about 9h. in the forenoon, *Gasse* at *Paris*, with a *Telescope*, observed Mercury, appearing in the Sun, betw the North and West part of his body, and at 10h. 28′. he past off, making Angle with the verticall Circle at the Suns center (as we gather by the like observation made since) neerest 37°. ½.

The Æqual Time of the end of this Mercuriall Eclipse of the Sun was at *London, October* the $27^{th.}$ day 22^{h}. 14'. The Longitude of the Sun from the first Starre of Aries 6^{s} 16° 44'. 25''. and his Semidiameter, 16'. 6''. whence we compute the Geocentrick Sidereall place of Mercury 6^{s}. 16° 29'. 7''. with Latitude North, 5'. 21''. his Heliocentrick place 0^{s} 17° 17' 28''. reduced to his Orbite, 0^{s} 17° 18'. 10''. and his Inclination North, 11'. 33''.

	s	°	'	''
The place of Mercury in his Orbite:	0	17	18	10
The Aphelion substract.	7	13	48	0
The true Anomaly.	5	3	30	10
The Absolute Æquation Adde.	0	9	13	33
The Mean Anomaly.	5	12	43	43

To finde the place of the Nodes with the Inclinations of the Orbites of ♄ ♃ ♂ ♀ ☿

ANno 1587 *January* the 9th. day, 9^{h}. *P.M.* reduced to the Meridian of *London, Tycho Brahe* observed Saturn in Longitude from the first Starre of Aries, 11^{s}. 28° 42'. 53'' with Latitude (corrected by our Obliquity of the Ecliptick) 2° 27'. 23''. South; at which time by our Tables,

	s	°	'	''
The Mean Anomaly of Saturn was	4	11	30	24
His Heliocentrick Longitude	0	4	51	19
The Longitude of the Sun.	9	1	58	10
The complement of Commutation.	3	2	53	9
The Parallax of the Orbe substract.	0	6	8	24
The Geocentrick place of Saturn	11	28	42	55
His Elongation or distance from the Sun.	2	26	44	45

Again, *Anno* 1591 *December* the $9^{th.}$ day. 12^{h}. reduced to our Meridian, the Sidereall place of Saturn was observed by *Tycho*, 2^{s}. 12° 51' 42'' with Latitude (corrected as before) 31' 32'' South, and then according to our Tables,

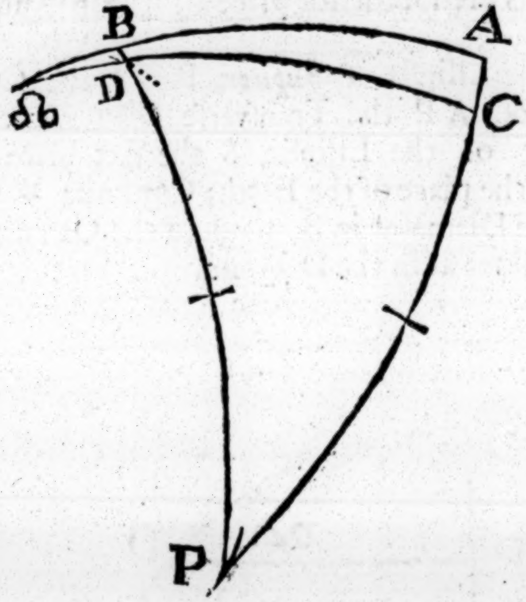
	s	°	′
The mean Anomaly of Saturn was	6	11	34
His Heliocentrick Longitude	2	11	29
The Longitude of the Sun.	8	0	11
The Commutation.	5	18	42
The Parallax of the Orbe, adde.	0	1	22
The Geocentrick place of Saturn.	2	12	52
His Elongation or distance from the Sun.	5	17	19

As the sine of Elongation, to the sine of Commutation, so the Tang of Latitude observed, to the Tangent of Inclination or Latitude at the S Therefore the Heliocentrick Latitude was in the first Observation 2° 27′ 2 in the second 28′ 4″.

Then let A ☊ be a part of the Ecliptick or Orbite of the Earth, P Pole thereof; C ☊ is part of the Orbite of Saturn, C his place in first and D his place in the second Observation.

Hence by the given Complements of Latitude, C P 87° 32′ 34″ PD 89′ 31′ 56″ with the Angle included, or difference of Heliocen Longitudes C P D 66° 38′ 35″. we find P D C equall to B D ☊ 87° 31′ which with D B 28′ 4″ and the right Angle at B gives B ☊ 10° 41′ 51″. Longitude of the Node from Saturn, and B ☊ D 2° 31′ 1″ for the Incli tion of his Orbite, and to his Heliocentrick Longitude in the second O servation 2s 11° 29′ 54″ adde B ☊ 10° 41′ 51″. the summe is 22° 11′ 45″. for the place of the Node.

A



A farther proof of the verity of our Fundamentals, and how by many exact Observations we have limited all our Numbers, with the true places of the Nodes, as well as the middle Motions of Mercury and Venus by their appearances in the Sun, the Calculation by our Tables will easily shew ; And that the Eclipticall Poles, with the Nodes or Intersections of the Orbites of the Primary Planets are really Fixt and Constant in the same Sidereal places, reason it self, with all certain and undenyable Observations will declare.

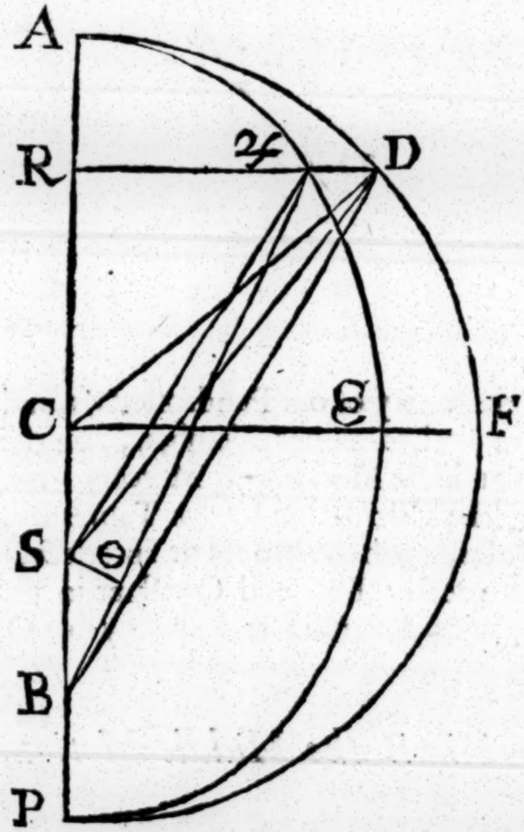
To Limit the Middle-Motions.

ANno *Christi* 508 *September* the 27th. in the morning, *Jupiter* was observed 3 Digits towards the North from *Cor Leonis*, and appeared then least distant from the Starre ; by which compared with other Observations, we determine the Geocentrick Sidereall Longitude of *Jupiter* at that time

3s.

$3^s\ 26^\circ\ 43'$ the place of the Sun was $5^s\ 22^\circ\ 45'$ and the Logarithm of th Earths distance from him. 4.998001. also the mean distance of *Jupiter* i 520110 parts. his Eccentricity. 25050. and the place of his Aphelio $5^s\ 9^\circ\ 50'$ whence his Heliocentrick place and Mean-Anomaly is required.

Let P ♃ A be the Ellipsis of *Jupiter*, P D A the Circle circumscribe C the Center thereof, A P the Transverse Diameter and C E the Co jugate semidiameter of the Ellipsis, S the fixt place of the Sun, ♃ th place of *Jupiter*, ⊖ the place of the Earth; Continue ♃ ⊖ untill it meet th line of the Transverse Diameter in B, produce the Ordinate R ♃ unto D an draw the other right lines as in the Diagram.



The solution is manifest by these following Operations.

	° ′ ″	
SB☉.	43 7 0. sin.	9.834730
S☉.		4.998001
S☉♃.	56 2 0. sin.	9.918745
		14.916746
SB	120786	5.082016
CS	25050	
CB	145836	

CF.	520110	5.716095
CE.	519506	5.715591
Diff.Log.		504
RB♃:	43° 7′ 0″.tan.	9.971429
RBD.	43 9 0: tan.	9.971933

CD	520110	5.716095
CB	145836	5.163865
Diff.Log.		552230
CBD	43° 9′ 0″ sin.	9.834999
CDB	11 3 21. sin.	9.282769
RCD	54 12 21	
½	27 6 10	

CD	520110	
CS	25050	
sum.	545160	5736524
diff.	495060	5694658

Diff. Log.		41866
	27° 6′ 10″.tan.	9.709089
	24 55 37.tan.	9.667223

CSD.	52° 1′ 47″.tan.	10.107655
Diff.Log. CF & CE		504
CS♃	51 59 51.tan.	10.107151
PS♃.	128° 0′ 9″	41866
½.	64 0 5.tan.	10.311845
	61 45.42. tan.	10.269979
	2 14 23	
Æq. Ell.−	4 28 46	
CS♃	51 59 51	504
sum:	56 28 37. tan.	10.178837
	56 26 47.tan.	10.178333
Var. +	1 50	
Æq. Abs.−	4 26 56	

Hence,

	s	°	′
The True Anomaly is (PS♃ with the semicircle)	10	8	0
The Absolute Æquation, substract		4	26 5
The mean Anomaly of *Jupiter*	10	3	33 1

Now by reason of the Uniformity of the Primary Planets Motions, it wi be needless in this place to adde any farther Demonstrations or examples fo finding them; We therefore after often trials and many carefull calculation conclude.

	The Mean-Anomaly at *London* *Anno* 1660. *December* the last day at noon. *T. Æq.*				The Middle-Motion in 20 *Julian* years or 7305 dayes.				
Of	s	°	′	″	Rev.	s	°	′	″
♄ *Saturn*	10	15	34	12	0	8	4	25	18
♃ *Jupiter*	11	24	13	0	1	8	6	59	30
♂ *Mars*	4	2	8	48	10	7	18	4	24
⊖ *The Earth*	6	13	40	19	19	11	29	53	1
♀ *Venus*	7	28	48	40	32	6	3	33	15
☿ *Mercury*	7	5	2	0	83	0	14	30	0

Of Saturn.

	s	°	'
The Sidereall Longitude of the Aphelion	7	28	30
The Longitude of the Ascending Node	2	22	30
The Inclination of the Orbite		2	30

The Transverse Semidiameter of the Ellipsis	953800
The Conjugate Semidiameter	952230
The Eccentricity.	54700

The Logarithm of Elliptick Æquation	49868
The Logarithm of Variation	715

Of Jupiter.

	s	°	'
The Sidereall Longitude of the Aphelion	5	9	50
The Longitude of the Ascending Node	2	8	0
The Inclination of the Orbite		1	20

The Transverse Semidiameter of the Ellipsis	520110
The Conjugate Semidiameter	519506
The Eccentricitie	25050

The Logarithm of Elliptick æquation	41866
The Logarithm of Variation	504

Of Mars.

	s	°	'
The Sidereall Longitude of the Aphelion	4	1	12
The Longitude of the Ascending Node	0	19	10
The Inclination of the Orbite		1	52

The Transverse Semidiameter of the Ellipsis		1523
The Conjugate Semidiameter		1517
The Eccentricitie		141
The Logarithm of Elliptick æquation		806
The Logarithm of Variation		18

Of the Earth.

	s	°
The Sidereal Longitude of the Aphelion	8	8
The Transverse Semidiameter of the Ellipsis		1000
The Conjugate		999
The Eccentricitie		17
The Logarithm of Elliptick æquation		150
The Logarithm of Variation		

Of Venus.

	s	°
The Sidereall Longitude of the Aphelion	9	5
The Longitude of the Ascending Node	1	15
The Inclination of the Orbite.		3
The Transverse Semidiameter of the Ellipsis		723
The Conjugate		723
The Eccentricitie		5
The Logarithm of Elliptick æquation		6
The Logarithm of Variation		

Of Mercury.

	s	°	'
The Sidereal Longitude of the Aphelion	7	13	48
The Longitude of the Ascending Node	0	15	42
The Inclination of the Orbite		6	54

The Transverse Semidiameter of the Ellipsis	38710
The Conjugate	37881
The Eccentricitie	7970
The Logarithm of Elliptick æquation	181427
The Logarithm of Variation	9406

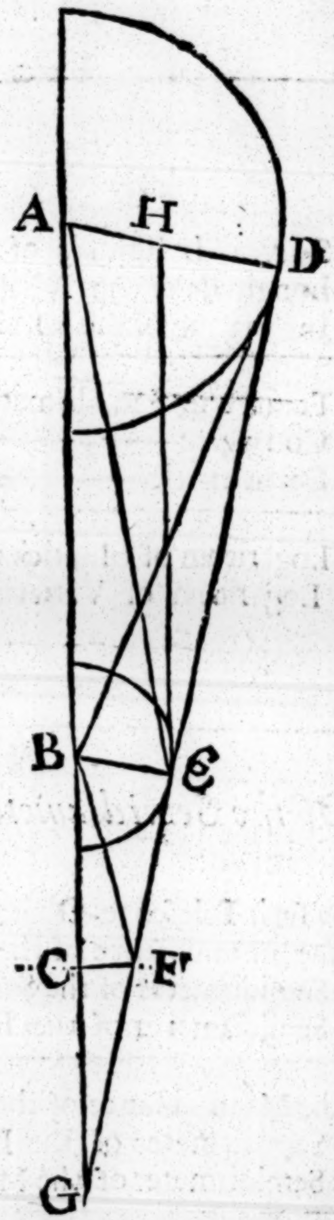
Of the Semidiameters of the Sun Earth and Moon &c.

By such Telescope-Observations extant as we esteem the best,

To the mean distance of the Earth from the Sun.	10000000
The Semidiameter of the Sun is of the same parts	46300
The Semidiameter of the Earth	727
To the Mean distance of the Moon from the Earth.	100000
The Semidiameter of the Earth is	1650
The Semidiameter of the Moon	446

Whence at all times the distance of the Luminaries being first found, we may easily obtain their apparent Semidiameters; and for the Semidiameter of the Earths shadow, in Lunar Eclipses, observe here the Diagram of Hipparchus, wherein,

Let A denote the Center of the Sun,
A D his Sediameter.
B the Center of the Earth,
B E her Semidiameter.
A E D or A B D (for the difference is insensible) the apparent Semidiameter of the Sun,
A E H or B D E his Horizontall Parallax.
C G F equall to H E D the Semiangle of the Cone of the Earths shadow.
B C and B F being equall to the distance of the Moon from the Earth,
B F E is her Horizontall Parallax, and C B F = the apparent semidiameter of the Earths shadow.



Hence.

1. The Semidiameter of the Sun, lesse by his Horizontall Parallax, is equal to the Semiangle of the Cone of the Earths shadow.

≪ A E D – A E H = H E D.

2. The Horizontall Parallax of the Moon, lesse by the Semiangle of the Cone of the Earths shadow, is eqnall to the apparent semidiameter of the Shadow.

≪ B F E – C G E = C B F. per 32.1 Eucl

3. The Aggregate of the Horizontall Parallax of the Luminaries, is equall to the Aggregate of the apparent Semidiameter of the Sun, and shadow of the Earth.

≪ B D F + B F D = A B D + C B F.

Therefore from the Aggregate of the Horizontall Parallax of the Sun and Moon, substract the apparent Semidiameter of the Sun, and there will remain the apparent Semidiameter of the Earths Shadow.

≪ B F D + B D F – A B D = C B F.

For the Proportionall Magnitudes of these three bodies.

The Semidiameter.			Logarithm.
Of the Sun.	46300		4 665581
Of the Earth.	727		2 861534
		differ:	1 804047
	258309.	tripl:	5 412141

Therefore the Globe of the Sun exceeds the Globe of the Earth in Magnitude. 258309. times.

The Semidiameter.			Logarithm.
Of the Earth.	1650		3 217484
Of the Moon.	446		2 649335
		differ:	0 568149
	$50.\frac{7}{11}$ *ferè*:	tripl:	1 704447

So the Earth is greater then the Moon 50 times and about: $\frac{7}{11}$ parts.

Of the Semidiameters, and Proportions of the other Primary Planets to the Earth.

COmparing the accurate observations of *Hugenius* lately published in his *Systema Saturnium*, with some other, and that of *Gassendus* of Mercury and *Horrox* of Venus seen in the Sun, we determine, the apparent greater Semidiameter of the ring of Saturn in his mean distance 30″. and

The Apparent Semidiameters of these 5 Planets in their mean distances from the Earth		″	‴
	♄	10	30
	♃	24	0
	♂	4	0
	♀	10	30
	☿	5	0

Which

Which in such parts as the Semidiameter of the Earth is 727. gives the Semidiameter of ——— { ☉ — 727, ♄ — 4855, ♃ — 6054, ♂ — 296, ♀ — 509, ☿ — 242 }

And hence the body of Saturn is greater then the Earth 298 times, and the magnitude of Jupiter is more then the Earth 577 times; but the Earth is greater then the other three, exceeding Mars 15 times, Venus 3 times, and Mercury 27 times.

Here it may be well worth our observation, that those Primary Planets that have Secondary or Attendants about them, are of greater Magnitude then those that have none, and

The More Attendants.
The Greater Orbe.
The Lesser inequality.
} Compared according to their number and proportion, are testimonies of the Greater Planet.

And we might likewise instance, that the fixt positions and distances of the Primary Planets Aphelions, are Correspondent to the Sympathie and Antipathie of their Natures; but these hints we only propose to the consideration of the Judicious.

I shall adde this necessary Demonstration of our friend Mr Robert Anderson, *not hitherto published by any.*

The Logarithmes of two sides of a plaine Triangle and the angle comprehended being given, to find the other angles.

The Analogies.

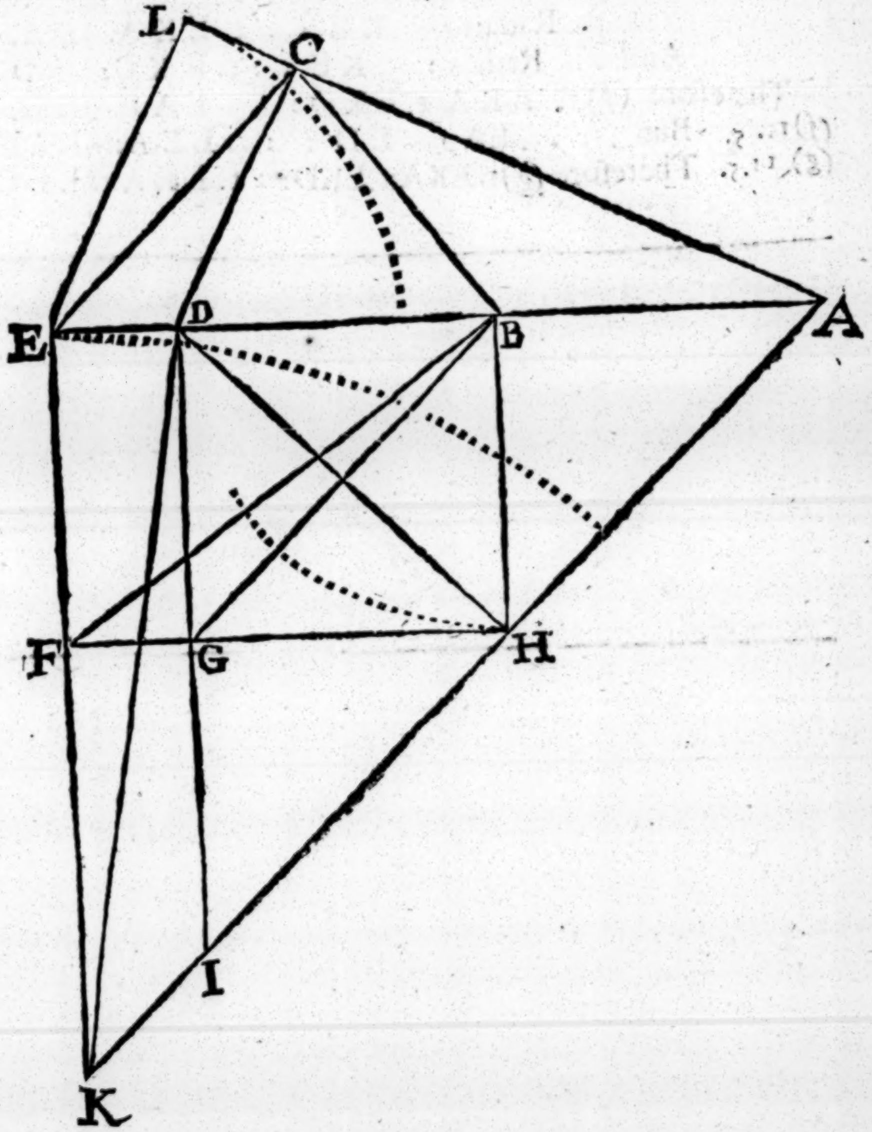
1. As the Lesser side is to the Greater, so is the Radius to the Tangent of an Arch.

2. As the Tangent of 45° is to the Tangent of the former found Arch Lesse 45° so is the Tangent of halfe the Opposite Angles, to the Tangent of halfe their difference.

Construction. Let E A (=E K) be the summe of the sides, E D the differenc

difference, EB (=F H) the greater, C B (=B A=BD=B H=H G) the lesser, and E B C the angle given.

Compleat the Diagramme, and make it B H: H F: : Radius: tangent F B H. then F B H—G B H=F B G=E K D.



Demonstration. For (*a*) H B: H A (=H D) :: H F: HK. (*b*) therefore the Triangles F B H and K D H are æquiangled, (*c*) but if F B H—G B H and K D H—IDH. F B G=KDI. (*d*) but K D I. =E K D. therefore (*e*) FBG=E K D.

(*a*) 4.6.
(*b*) 5.6.
(*c*) 3.ax.1.
(*d*) 29.1.
(*e*) 1.ax.1

The

The ſecond Analogie which is tangent EKA: tangent EKD: : tange
LEA: tangent LEC.

Demonſtration

Radius: KE : : t. EKA: EA.

And . . . Radius : KE : : t: EKD: ED.

Therefore (*f*) t. EKA: t. EKD : : EA : ED.

(*f*) 11. 5. But . . . . EA : ED : : t. L*E*A: t: L*E*C.

(*g*) 11. 5. Therefore (*g*) t. *E*KA: t. EKD: : t. LEA: t: L*E*C.

Of the USE of our TABLES.

THe Radix of each Middle-Motion being accommodated to the last day of the Julian year in the Meridian of *London* the Metropolis of Great Britain ; Decem 31

1. *For the Temporary difference of the Meridians of* London *and other Places.*

IN the Catalogue of Places, I find *Uraniburg* in *Denmark* oh. 50′. Ori. that is, so much to the *East* from *London*; therefore the Sun being in the Meridian of *London*, the Time at *Uraniburg* is o ho. 50′ after noon. but supposing the Sun in the Meridian of *Uraniburg* the Time at *London* is 11 ho. 10′. of the forenoon. In the same Catalogue I find *Dublin* in *Ireland* o ho. 26′. Occ. that is 26′ to the West; therefore from the given Time at *London* substract 26′, the residue shall be the Time at *Dublin*; or to the given Time at *Dublin* adde 26′, the summe is the Time at *London*. pag. 1

2. *To reduce the Apparent Time to the* Equall, & Contra.

UNder the Title (*TABULÆ ÆQUATIONIS TEMPORIS*) Enter the first Table with the Sign and degree of the Suns Longitude from the Æquinox, and the Second with the Mean Anomaly of the Earth, so have you the Æquation in two parts, of which, if both adde or both substract, the summe, but if the one adde and the other substract, the difference (according to the greater part) is the absolute Æquation, which as the Titles direct, added or substracted to or from the Apparent Time, gives the Equall ; but to reduce the Equall to the Apparent take the Contrary Titles. p 5

3. To

3. *To Compute the true Longitudes of the Sun and fixt Starres.*

ANno 1586. *July* the 27th day in the Meridian of *Vraniburg* by th[e] observation of Noble *Tycho Brahe* the true place of the Sun was. ♌ 13°.21′.35″. The time reduced to the Meridian of *London* was *July* th[e] 26th day 23 ho.10′. æquated 23 ho.25′.

P 6 First in the Table entituled *Terra Tabula Motus Medii, &c.* findin[g] the neerest lesser year, and adding the residue of yeares, with the Mont[h,] day, houre and Minute, I set them downe in order, with the Mean Ano[-]maly of the Earth and Præcession of the Æquinox answerable unto the[m] and by addition gathering the totall summes, I have the Mean Anomaly an[d] Præcession as followeth.

	s	°	′	″	s	°	′	″
1581	6	14	8	15	0	27	20	0
5	11	29	43	28			4	0
Julii	5	28	23	44				24
d. 26	0	25	37	33				3
h. 23			56	40				
′. 25			1	2				
Anom: Med: ⊖	1	8	50	42	0	27	24	27. Præc.æq.

P 7 Then with the Mean Anomaly, in *Tabula Æquationis Terra* next fo[l]lowing (by making proportion as need requires) I find the æquatio[n] 1° 13′ 27″. which (according to the Title) substracted from the mea[n] Gives the True Anomaly 1s 7° 37′ 15″. to which adding the Apogæo[n] 2s 8° 20′. the Longitude of the Sun, from the first starre of Aries is 3s 1[5°] 57′ 15″. and to this the Præcession 0s 27° 24′ 27″. the summe is his Lon[-]gitude from the æquinox 4s 13° 21′ 42″.

P.8 Otherwise, with the mean Anomaly of the Earth 1s 8° 50′ 42″. I en[-]ter the Table entituled *SOLIS TABVLA LOCI GEOCEN[-]TRICI.* and (making proportion by the Table of Logisticall Logarithms) I find the Longitude of the Sun from the first starre of Aries 3s 15° 57′ 15″ to which adding the Præcession 0s 27° 24′ 27″. the summe is his Longitud[e] from the æquinox 4s 13° 21′ 42″. as before, that is ♌ 13° 21′ 42″.

An oth[er]

An other Example.

Anno 1590. *March* the 11th day at *Uraniburg* by *Tycho's* obſervation of the Suns Meridionall Altitude, his true place was. ♈. 0°. 33′. 19″. The Apparent Time at *London* was *March* the 10th day 23h. 10′. but the mean or equall time 23h. 2′.

	s	°	′	″	s	°	′	″	
1581	6	14	8	15	0	27	20	0	
9	11	29	42	4			7	12	
Martii	1	28	9	4				8	
d. 10		9	51	22				1	
*h.*23			56	40					
′. 2				5					
Anom. Med. ⊖.	8	22	47	30	0	27	27	21.	*Prac.*
Long. ☉ *a* 1 ✳ ♈	11	3	5	57					
Præceſs. Æqui.	0	27	27	21					
Long. ☉ *ab Æqu.*	0	0	33	18					

Therefore, *Anno Chriſti* 1590. *March* the 10th day 23ho. 2′. *T. M.* the true Place of the Sun was in ♈ 0° 33′ 18″.

And the Præceſſion is the Longitude of the firſt Starre of *Aries* from the Vernall æquinox, which added to the Longitude of any other fixt ſtarre in our Catalogue, the ſumme is the true Longitude thereof from the æquinox.

4. *To find the Exact Time of the Tranſit of the Earth (or Sun) by any point of the Ecliptick.*

Anno 1661. of the Vernall æquinox (which by vulgar rules happeneth on the 9th or 10th of March) the day houre and minute is required.

The Operation stands thus.

	s	°	'
The Longitude of the Sun from the Æquinox.	0	0	0
The Præcession of the Æquinox, substract.	0	28	24
The Longitude of the Sun from the first ✱ of ♈ is	11	1	35
The mean Anomalie Correspondent.	8	21	17
Anno 1661.	6	13	40
	2	7	37
Martii:	1	28	9
		9	28
d: 9.		8	52
			36
h. 14			34
' 40.			1

Therefore, *Anno* 1661. the Equall Time of the Vernall Æquinox *March* the 9th day 14ho. 40'. To which adding 8' for the æquation of Naturall Dayes, the Apparent time at *London* is 14ho. 48'.

5. *To Calculate the true place of the Moon in her Orbite, &c.*

1. TO the given time find the true Longitude of the Sun from the Vernal Æquinox, as before.

2. In *Lunæ Tabula Mediorum Motuum*, gather the Mean Anomaly and place of the Apogæon, in like manner as the Midd e Motion of the Earth in the two first examples. Only for the Node, from the radical place thereto the year first found in the Table, substract the Middle Motion answerable to the residue of years with the month, day, hour, &c.

3. With the mean Anomaly (in *Tabula Æquationis Eccentrici*) find the Æquatio

Æquation, which (as the Title directs) added or substracted to or from the Mean, gives the true Anomaly, to which adding the Apogæon the summe is the first Æquated place of the Moon.

4. From the first Æquated place of the Moon, substract the true place of the Sun, the residue is the distance of the Moon from the Sun, which doubled, with the double distance (in *Tabula Reflectionis*) you have the Reflection, P 13 which (according to the Title) added or substracted to or from the true Ano- Anom. æquata maly of the Moon, gives the Anomaly correct. substracts it in ye example next following

5. For the Synodical Anomaly, The Moon passing from the Conjunction or Opposition of the Sun to the Quadrature, the Complement to a quadrant of her distance from the Sun is to be added to the Anomaly correct;

But from the Quadrature to the Conjunction or Opposition, the excess above a Quadrant of the distance of the Moon from the Sun is to be substracted from the Anomaly correct;

And the Sum or difference is the Synodical Anomaly, of which if it be less then six signs take the half, if more take the half of the Complement to 12 signes.

6. To the Logarithm of the Diameter of the Circle of Evection adde the sine of the distance of the Moon from the Sun, the summe rejecting the Radius is the Log. of the Chord of Evection, which substract from the Log. found by the Mean Anomaly, (in *Tabula Logarithmorum à Terra Luna Distantiarum*) P 14 and to the residue adde the Radius, it shall be the Tangent of an Arch, from which rejecting 45°. As the Radius, to the Tangent of the remaining Arch, so the Tangent of the half Synodical Anomaly or Complement, to the Tangent of an Arch, whose difference from that half is the Angle of Evection, which, if the Synodical Anomaly were less then six signes substracteth, if more it addeth.

And if the Evection and Reflection shall both adde or both substract their summe, otherwise their difference (according to the greater part) is the absolute secondary Æquation, which added or substracted to or from the place of the Moon first æquated, gives her true Longitude in her Orbite.

Example.

Anno 1586. *September* the 22d day, 14 h. 24′. was the equal Time reduced to our *Meridian*, when Noble *Tycho* observed the place of the Moon in the *90th* degree of the Ecliptick.

The place of the Sun was then ♎ 9° 24′ 15″.

	Anom: ☽.				Apog.				☊			
	S	°	′	″	S	°	′	″	S	°	′	″
1581	3	8	49	0	4	15	5	0	10	8	21	30
5	3	6	39	58	6	23	25	50	3	6	41	50
Sep.	9	24	47	31	0	27	4	19		12	52	6
d. 22	9	17	25	47		2	27	3		1	9	54
h. 14		7	37	16			3	54			1	51
′ 24			13	4				7				3
An.med.☽.	2	5	32	36	0	8	6	13	3	20	45	44
Æq. ſub.		4	34	35					6	17	35	46
An: Vera.	2	0	58	1	2	0	58	1				
Apog.	0	8	6	13	Ref. Ad.		32	44				
☽ 1 Æqu.	2	9	4	14	2	1	30	45				
☉ Ver.	6	9	24	15	add. 1	0	20	1				
☽ à ☉.	7	29	39	59	Sy. 3	1	50	46				
Dupl.	3	29	19	58	½	45	55	23				
☾Æq.2.ſub.		1	32	52								
☽ in Orb.	2	7	31	22								

R.	3. 64243
S. 59° 29′ 59″.	9. 93606
	3. 57649
	5. 01385
t. 87 54 29.	11. 43736
r.t. 42 54 29.	9. 96825
t. 45 55 23.	10. 01399
t. 43 49 47.	9. 98225
Eve 2 5 36. ſub.	
Ref. 0 32 44. Add.	
☾Æq.2. 1 32 52. ſub.	

For the Latitude, and Reduction of the Moon from her Orbite to the Ecliptick.

1 WIth the double diſtance of the Moon from the Sun 3ˢ 29° 19′ 58″ (in *Tabula Æquationis Nodorum Lunæ*) I find the Æquation 1° 31′ 32″ ſub. therefore ſubſtracting it from the middle Motion of ☊ before found 6ˢ 17° 35′ 46″, there remains the true place of the Node 6ˢ 16° 4′ 14″ which ſubſtracted from the place of the Moon in her Orbite 2ˢ 7° 31′ 22″, the reſidue is the Argument of Latitude 7ˢ 21° 27′ 8″. that is, 51° 27′ 8″ from ☋.

2. With the diſtance of the Moon from the Sun 7ˢ 29° 39′ 59″ (in *Tabula Exceſſus Lunæ Latitudinis, &c.*) I find the Exceſs 13′ 25″, which to the time propoſed gives the Angle of the greateſt Latitude of the Moon 5° 13′ 25″, and the Analogy is,

For the Latitude.					For the Reduction.				
	°	′	″			°	′	″	
Rad. ſin.	51	27	8	9. 89326	Rad. Co-ſin.	5	13	25	9. 9981
ſin.	5	13	25	8. 95925	tan.	51	27	8	10. 0986
ſin.	4	5	0	8. 85251	tan.	51	20	10	10. 0968
Lat. ☽ Auſt.					Differ.		6	58.	Red. ☽ ſub.

The

Therefore (by the work, and Titles of the next following Table) the true Latitude of the Moon was South 4° 5′ 0″, and from the Longitude of the Moon in her Orbite 2ˢ 7° 31′ 22″. the Reduction substracts 6′ 58″, leaving her true place in the Ecliptick 2ˢ 7° 24′ 24″, that is ♊ 7° 24′ 24″. Observed ♊ 7° 25′ *ferè.*

An other Example of the place of the Moon in Longitude and Latitude.

ANno 1594. *December* the 19th. day 15 h. 3′. æquated and reduced to the Meridian of *London*, *Tycho Brahe* observed the place of the Moon, exactly in the Nonagesime degree, in ♌ 13° 49′, with North Latitude, correct by parallax 5° 5′, to which time we compute the true place of the Sun ♑ 8° 17′ 26″.

	Anom. ☽	Apog.	☊
	s ° ′ ″	s ° ′ ″	s ° ′ ″
1581	3 8 49 0	4 15 5 0	10 8 21 30
13	3 22 33 28	5 18 57 50	0 11 26 2
Dec.	1 13 42 20	1 7 12 37	17 41 14
d. 19	8 8 14 5	2 7 0	1 0 22
h. 15	8 9 56	1 14	1 59
′ 3	1 38	1	0
An. Med.	5 1 30 27	11 13 26 39	9 0 9 37
Æq. sub.	2 23 47		1 8 11 53
An. ver.	4 29 6 40		*Sub:* 1 37 42
Apog.	11 13 26 39		1 6 34 11
☽ 1 *Æq.*	4 12 33 19		
☉	9 8 17 26		
☽ d ☉	7 4 15 53		
Dupl.	2 8 31 46		
Æqu: 2. Add.	1 14 35		
☽ *Orb.*	4 13 47 54		
☊ *sub.*	1 6 34 11		
Arg. La.	3 7 13 43		
Red. add:	1 42		
☽ *Ecli:*	4 13 49 36		

☊	s ° ′ ″
An: ver:	4 29 6 40
Ref add:	34 57
An: Cor:	4 29 41 37
Comp: dist: ad:	1 25 44 7
An: Synod:	6 25 25 44
Compl:	5 4 34 16
½	77 17 8

R:		3. 64043
sin:	34° 15′ 53″.	9. 75052
		3. 39095
		4. 97251
tan:	88 29 55.	11. 58156
R: *t:*	43 29 55.	9. 977229
t:	77 17 8.	10. 646613
t:	76 37 30.	10. 623842
Eve:	0 39 38. *Adde:*	
Ref:	0 34 57 *Adde:*	
Æq: 2.	1 14 35 *Adde.*	
R: *cs:*	5 5 43.	9. 99828
t:	82 46 17.	10. 89675
t:	82 44 35.	10. 89503
Differ:	1 42. *Red:* ☽ *Adde.*	
R: *s:*	82 46 17.	9. 99653
s:	5 5 43.	8. 94847
Lat: ☽ *Bor: s:*	5 3 17	8. 94500

Therefore by our Tables, the true *Longitude* of the Moon in the Ecliptick was ♌ 13° 49′ 36″. and her *Latitude* North 5° 3′ 17″.

6. To

6. *To Compute the Apparent Sidereall Places of the five Planets.* ♄ ♃ ♂ ♀ ☿.

1. TO the time proposed, with the mean Anomaly of the Earth find t[he] *Longitude* of the Sun from the first Star of *Aries* as before, and ([in] *Tabula Logarithmorum à Sole Terra Distantiarum*) the *Logarithm* of t[he] Earths distance from the Sun.

2. As of the Earth, so of the other Planet whose place is required (*in T[a]bula Motus Medii ab Aphelio*) gather the mean-Anomaly, with which ([in] *Tabula Loci Heliocentrici*) you have (by making proportion, *&c.*) the He[li]ocentrick Sidereall *Longitude* reduced to the Ecliptick, with the Inclinati[on] and *Logarithm* of the Curtate distance of the Planet from the Sun.

3. From the *Longitude* of the Sun, substract the Heliocentrick *Longitu[de]* of ♄ ♃ or ♂, but from the Heliocentrick *Longitude* of ♀ or ☿ substract the *Lo[n]gitude* of the Sun, the residue is the Commutation, of which if less then *6* si[gnes] or the complement to a Circle if more, take the half.

4. To the difference of the Logarithms of the Earth and the other Pla[net] adde the Radius, it shall be the Tangent of an Arch, from which reje[ct]ing 45°.

As the Radius, to the Tangent of the remaining Arch, so the Tangent [of] the half Commutatison or complement, to the Tangent of an Arch, of wh[ich] and that half, the summe is the Elongation of ♄ ♃ or ♂ from the Sun, and t[he] difference the Parallax of the Earths Orbe ; but of ♀ or ☿ the differenc[e] the Elongation.

5. If the Commutation be lesse then *6* signes, the Parallax of the Or[be] is to be added to the Heliocentrick Longitude of ♄ ♃ or ♂, and the Elong[a]tion of ♀ or ☿ to the Longitude of the Sun ;

But if the Commutation be more then *6* signes, the Parallax of the Or[be] is to be substracted from the Heliocentrick Longitude of ♄ ♃ or ♂, and t[he] Elongation of ♀ or ☿ from the *Longitude* of the Sun ; And the summe [or] difference is the true Geocentrick *Longitude* of the Planet from the first S[tar] of Aries.

6. As the sine of Commutation, to the sine of Elongation, so the tange[nt] of Inclination, to the tangent of the Geocentrick *Latitude* of the Planet.

Exampl[e]

Example of Saturn.

ANno 1593. *January* the 8th. day 9h. 15′. reduced unto *London*, the Sidereall Longitude of Saturn, being by the Observation of *Tycho*, 2ˢ 25° 38′ and his correct *Latitude* North 10′. his place by our *Tables* is required. The Longitude of the Sun (*à* 1 ✶ ♈) was then 9ˢ 1° 26′ 8″ and the Logarithm of the distance of the Earth from the Sun 4, 993006.

	s	°	′	″
1581	1	27	53	0
12	4	26	39	11
Jan. 8.			16	4
h. 9.				45
′. 15.				1
Anom. Med. ♄	6	24	49	1
Long. Heliocent	2	26	15	44
Long. ☉.	9	1	26	8
Commutatio.	6	5	10	24
Comp. ad Circ	5	24	49	36
½		87	24	48
Parall. Orb. sub.		0	37	49
Long. ♄ *Geocent.*	2	25	37	55

	°	′	″	
				5 95653
				4 90[illegible]01
tan.	83	47	[illegible]34	10 96352
r. tan.	38	47	34	9 90515
tan.	87	24	48	11 34509
tan.	86	46	59	11 25024
sum.	174	11	47	*Elongatio.*
differ.	0	37	49	*Paral. Orb.*
sin:	5	10	24	8 95506
sin:	5	48	13	9 00483
tan:	0	9	51	7 45716
Lat. ♄ *Bor:*			16	46199
tan.	0	11	3	7 50693

Of

Of Jupiter.

ANno 1627. *April* the 25th day 12h reduced to the Meridian of L-*don*, a Learned German by help of a perspective, observed the center *Jupiter* and the Northern brightest starre in the front of ♏ distant 3½ Planet being in Antecedence and a little lower, in lesse latitude then the The place of the star is in Longitude from the first of ♈ 6s 29° 59′. Latitude North according to *Tycho* 1° 5′. The Sidereall Longitude of Sun by our Tables 0s 17° 6′ 30″. and the Logarithm of the *Earths* dist 5.004606.

	s	°	′	″
1621	7	10	14	0
6	6	2	3	21
April.		7	28	42
d. 25		2	4	38
h. 12			2	30
Anom. Med. ♃.	1	21	53	11
Long. Heliocent:	6	27	32	33
Long. ☉	0	17	6	30
Commutatio.	5	19	33	57
½		84	46	58
Paral. Orb. Adde.		2	23	58
Long. ♃ *Geocent:*	6	29	56	31

	°	′	″		
				5	72935
				5	00461
tan.	79	19	34	10	72474
r: tan.	34	19	34	9	83431
tan.	84	46	58	11	03948
tan.	82	23	0	10	87379
sum.	167	9	58	*Elongatio.*	
differ.	2	23	58	*Paral. Orb.*	
sin.	10	26	3	9	25793
sin.	12	50	2	9	34660
tan.	0	51	55	8	17907
Lat. ♃ *Bor.*				17	52567
tan.	1	3	40	8	26774

Of Mars.

ANno 1634. *May* the 29th day 12h. 7′ was the Equall Time at *London*, when *Gassendus* in his larger Telescope observed Mars conjunct in the same *Longitude* with the starre in the extremity of the south wing of ♍ which in our Catalogue is 4s 23° 55′ from the first of ♈, with *Latitude* North 43′.) the *Latitude* of the Planet appearing lesse by 3 times the quantity of his own diameter. The Sidereall *Longitude* of the Sun was then 1s 19° 54′ 18″. and the *Logarithm* of the Earths distance 5. 007064.

	s	°	′	″
1621	0	26	0	0
13	10	28	7	0
May	2	2	53	3
d. 29		15	11	49
h. 12			15	43
′. 7				9
Anom. Med. ♂.	2	12	27	44
Long: Heliocent:	6	3	55	24
Long. ☉	1	19	54	18
Commutatio	7	15	58	54
Comp: ad Circ.	4	14	1	6
½		67	0	33
Parall:Orb.Sub.	1	9	59	41
Long: ♂ *Geocent.*	4	23	55	43

	°	′	″	
				5 197970
				5 007064
tan.	57	12	22	10 190906
r.tan.	12	12	22	9 335095
tan.	67	0	33	10 372341
tan.	27	0	52	9 707436
Sum.	94	1	25	*Elongatio.*
diff:	39	59	41	*Paral. Orb.*
sin.	45	58	54	9 85680
sin.	85	58	35	9 99893
tan.	0	29	27	7 93282
Lat. ♂ *Bor.*				17 93175
tan.	0	40	51	8 07495

Of Venus.

ANno 1639. *November* the 24th day in the Evening, about 16 mile the North from Liverpool, Mr *Jeremy Horrox* with a Telescope obse this appearance of Venus in the Sun.

Horol.		*Centr. dist.*		*Diam.* ♀ *obser. ad Diam.* ☉
h	′	′	″	*ut* 1′ 12″. ad 30′.
3	15	14	24	
3	35	13	30	
3	45	13	0	
3	50	*Solis occasus apparens. Verus.* 3 ho. 45′.		

And at 3 ho. 15′. *Venus* in her Immersion or totall Ingresse on the S East part of the Sun, made the Angle with the verticall circle at his c 62. $\frac{1}{2}$. degrees.

The Equall Time at *London* was 3h. 19′, and by our Tables, the L tude of the Sun from the first starre of ♈. 7s 14° 15′ 26″ from the A nox in ♐ 12° 22′ 33″ the Logarithm of the Earths distance 4.993 the semidiameter of the Sun 16′ 10″. and hence the semidiameter of V 39″. the parallax of Venus from the Sun in Altitude 42″. in Long 13″ in *Latitude* 39″. Therefore, the Geocentrick Sidereall Long of Venus 7s 14° 26′ 30″. and her *Latitude* South 10′ 27″.

	s	°	′	″
1621	7	21	42	10
18	3	2	23	52
Novemb.	4	7	2	50
d. 24	1	8	27	4
h. 3			12	1
′ 19			1	16
Anom. Med. ♀	4	9	49	13
Long. Heliocent.	1	14	11	22
Long. ☉	7	14	15	26
Commutatio	5	29	55	56
$\frac{1}{2}$		89	57	58
Elong. Adde.	0	0	11	5
Long. ♀ *Geocent.*	7	14	26	31

	°	′	″		
				4	99306
				4	85736
tan.	53	48	33	10	13570
r. *tan.*	8	48	33	9	19025
tan.	89	57	58	13	22829
tan.	89	46	53	12	41854
differ.	0	11	5	*Elongatio.*	
sin.	0°	4′	4″	7	0729
sin.	0	11	5	7	5084
tan.	0	3	51	7	0491
Lat. ♀ *Aust.*				14	5575
tan.	0	10	30	7	4846

Of Mercury.

ANno 1636. *August* the 24th. day 16 h. 23′. T. M. reduced unto *London*, *Gassendus* at *Dinia*, by the benefit of a Telescope, observed Mercury as it were in the middle between verticall and to the left hand from *Cor Leonis*, yet more to the Vertex then the left; afterwards with an Astronomick radius, he took the distance of Mercury from the Star 23′ 20″ and after that 22′ 48″.

By the observed bearing and distance with the position of the Zodiaque, *&c.* We determine the Longitude of Mercury 11 or 12′ in antecedence from the Srarre, and his Latitude between 20 and 21′ more Northerly. The place of the Starre is from the first of ♈. 3s 26°. 40′ with Latitude North (Correct by our obliquity of the Ecliptick) 27′ 20″. The sidereall Longitude of the Sun 4s 13° 51′ 29″ and the Log. distance of the Earth 5.002996

	s	°	′	″		°	′	″	
1621.	6	6	2	0					5.002996
15.	3	7	48	21		°	′	″	4.487573
August.	4	27	34	29	tan.	73	1	41	10.515423
Biss. 24.	3	12	18	30	r. tan.	28	1	41	9.726187
h. 16.		2	43	42	tan.	47	48	18	10.042591
′ 23.			3	55	tan.	30	25	16	9.768778
Anom. Med. ☿	5	26	30	57	Diff.	17	23	2	*Elongatio.*
Long. Heliocen.	1	8	14	53	sin.	84	23	24	9.99791
Long. ☉	4	13	51	29	sin.	17	23	2	9.47534
Comp. Commu.	3	5	36	36	tan.	2	39	23	8.66648
		47	48	18	Lat. ☿ Bor.				18.14182
Elong sub.	10	17	23	2	tan.	0	47	53	8.14391
Lon. ☿ *Geocent*	3	26	28	27					

For

For the Longitudes from the Æquinox.

TO the Time given, finding the Præceſſion of the Æquinox, and addin[g] it to the ſidereall Longitude of any Planet; you have (in like manne[r] as of the Sun and Fixt-Starres) the true Longitude of the Planet from th[e] Æquinox.

As in the laſt example of Mercury, *Anno* 1636 *Auguſt* the 24th, *&c.* th[e] Præceſſion is by our Tables 0s 28° 4′ 31″. which added to the Geoce[n]trick ſidereall Longitudes there found, the place of the Sun from the Æqu[i]nox is in ♍ 11° 56′ 0″. *Cor Leonis* in ♌ 24° 44′ 31″. and Mercury i[n] ♌ 24° 32′ 58″.

7. *To find the time of the Mean Conjunction or Oppoſitio[n] of the Sun and Moon.*

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18

TO the given Year and Month (*In Tabula Motus Medij Lunæ à Sole*) Gather the middle motion of the Moon from the Sun, and take th[e] Complement thereof to a Circle, from which, or the ☍ (gathered by th[e] Addition or Subſtraction of 6 Signs,) more continually ſubſtracting the neareſt leſſer middle-Motions, the anſwerable Day, Houre, Minute, *&c.* is the exact middle time of the Mean ☌ or ☍ of ☉ and ☽.

Example.

Anno 1659. in *October*, I would know the exact time of the mean Oppoſi[-]tion of the Sun and Moon.

	s	°	'	''
1641	11	14	19	57
18	7	11	58	32
Octob.	2	28	4	27
Mot. ☽ *à* ☉	9	24	22	56
Comple.	2	5	37	4
☍	8	5	37	4
d. 20	8	3	48	53
		1	48	11
h. 3		1	31	26
' 33			16	45

Therefore the Mean ☍ is *October* the 20th. day 3 ho. 33'.

Again, in *November* the same year, the time of the Mean Conjunction of ☉ and ☽ is required.

	s	°	'	''
1641	11	14	19	57
18	7	11	58	32
Novem.	3	15	59	14
Mot. ☽ *à* ☉	10	12	17	43
Comple.	1	17	42	17
d. 3	1	6	34	20
		11	7	57
h. 21		10	40	1
' 55			27	56

And hence the Mean ☌ in *November* is the 3. day 21 ho. 55'.

8. *For the time of the true Conjunction or Opposition of the Luminaries.*

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1 TO the time of the Mean ☌ or ☍, Compute the true Longitude the Sun from the Æquinox and the place of the Moon first quated.

2 If the places of ☉ and ☽ so found be exactly the same or Oppos the Time of the Mean and True ☌ or ☍ are one; but if they differ (commonly it happeneth) take the difference, and with the Mean Anomaly of ☉ and ☽, the Anomaly of ☽ being correct by the Addition or Sub ction of about half so much as she wants of or is past the ☌ or ☍ (*in bula Motuum Horariorum* &c. Under the Titles *Horar* ☉ *Verus* and *rar.* ☽ *Pri.Æquat.*) seek the true hourly motion of the Sun, and the æquated hourly motion of the Moon; the proportion shall be,

As the difference of the hourly motions, to the difference or distance the Luminaries from ☌ or ☍, so is one houre or 60′ to the inte of the Mean and True ☌ or ☍, which is alwayes lesse then four houres.

3 If the Moon were found wanting of the ☌ or ☍ the Intervall ded, if past the ☌ or ☍ substracted, to or from the Mean, gives the mi Time of the True ☌ or ☍ of ☉ and ☽; To which Time (for farther tr Compute again the true place of ☉, and of ☽ first æquated, and the e time being obtained;

4 From the place of the Moon in her Orbite substract the place of ☊, with the residue or *Arg. Lat.* (*in Lunæ Tabula Latitudinis veræ ac Redu onis*, &c.) find her Reduction, and then, with the mean Anomaly of ☽ found(*in Tabula Motuum Horariorum*, &c.under the Title *Horar* ☽ *in Syz* the true hourly motion of ☽, from which substracting the hourly mo of ☉;

As the true hourly motion of ☽ from ☉, to the Reduction, so is one ho or 60′, to the Time of Reduction, which (Contrary to the Title of Reducti added or substracted to or from the Time of the True ☌ or ☍ before fo gives the middle or equall Time of the True ☌ or ☍ reduced to the Ec tick.

Exam

Example.

	d.	h.	′	″
ANno 1659 in October the mean ☍ is	20	3	33	0
	s	°	′	″
The mean Anomaly of the Sun correspondent	4	2	7	14
Of the Moon.	9	27	12	6
The true Longitude of ☉ from the Æquinox:	7	7	8	16
he first æquated place of ☽ in the Orbite.	1	13	18	33
he difference from the ☍ past	0	6	10	17
he hourly Motion of ☉.	0	0	2	30
☽ first æquated (to 9s 24° of mean Anomaly.)	0	0	31	46
he difference of hourly Motions	0	0	29	16
	d.	h.	′	″
he Intervall of the Mean and True ☍ substract	0	12	38	53
he Equall Time of the True ☍	19	14	54	7

To which Time,

	s	°	′	″
THe mean Anomaly of the Sun is	4	1	36	4
Of the Moon.	9	20	18	59
he true place of the Sun.	♏.	6	36	32
Of the Moon in her Orbite.	♉.	6	36	32
he Argument of Latitude.	5	22	24	9
he Reduction, Adde.			1	43
he true hourly motion of ☽ 32′ 5″. from ☉.			29	35
he time of Reduction. Substract.			3′	29″
	d.	h.	′	″
he Equall time of the True ☍ in the Ecliptick	19	14	50	38

9. *To Calculate an Eclipse of the Moon.*

1 TO the time of the true ☍ of ☉ and ☽, with the mean Anomaly of the Luminaries (*in Tabula Motuum Horariorum, Semidiametrorum*,&c. under the Titles, ***Semid.*** ☉, ***Semid.*** ☽, ***Parall.*** ☽, &c.) you have their apparent Semidiameters with the Horizontall Parallax of the Moon, the Horizontall Parallax of the Sun being ever 15″. Then from the Aggregate or summe of Horizontall Parallaxes, substract the Semidiameter of ☉, and there will remain the apparent Semidiameter of the Earths shadow.

2 To the Semidiameter of the shadow adde the Semidiameter of ☽, and with the Argument of the Latitude of ☽ in the true ☍ (*in Luna Tabula Latitudinis*,&c.) find her Latitude; if the summe of the apparent Semidiameters of the Moon and shadow of the Earth shall be greater then the Latitude of ☽, she will be really Eclipsed at that time, else not.

3 If the Moon be found Eclipsed, from the summe of the Semidiameters of the Moon and shadow of the Earth substract the Latitude of ☽, the residue is the Part Deficient, and as the Semidiameter of ☽, to 6 Digits or 360′, so the Part Deficient, to the Digits Eclipsed.

4 The time of Reduction (according to the Title of Reduction) added or substracted to or from the time of the true ☍ of ☉ and ☽ in her Orbite first found, gives the time of the greatest obscuration.

5 As the Co-sine of the Latitude of ☽, to the Radius, so the Co-sine of the summe of the Semidiameters of the Moon and shadow, to the Co-sine of the motion of half duration; or reducing the arches into seconds, and supposing the proportion in a right lined Triangle, from the square of the summe of the Semidiameters of the Moon and shadow, substract the square of the Latitude of ☽, the square root of the residue is the motion of half Duration.

6 As the true hourly motion of ☽ from ☉, to one houre or 60′, so the motion of half Duration, to the Time, which substracted from, and added to the time of the greatest obscuration, gives the Time of the beginning and end of the Eclipse.

Example.

Example.

At the Equall time of the true ☍. *Anno* 1659. *October* the 19th day 14ho.54′.7″.

		′	″
The summe of the Horizontall Parallax of ☉ and ☽ is		55	27
The semidiameter of the Sun substract:		16	4
The semidiameter of the Earths shadow.		39	23
The semidiameter of the Moon.		14	55
The Aggregate of semidiameters.		54	18
The Latitude of the Moon. North.		39	37
The part deficient.		14	41
The Digits Eclipsed.	*Dig:* 5	54	22
The time of Reduction. adde.		3	29
The Equall time of the Greatest Obscuration.	*Ho.* 14	57	36
The æquation of Naturall daies. adde.		2	31
The Apparent time of the Greatest Obscuration.	*Ho:* 15	0	7
The Motion of half duration.		37	8
The time of half duration.	*Ho:* 1	15	19
The beginning of the Eclipse	*Ho:* 13	44	48
The End.	*Ho:* 16	15	26

But in Totall Eclipses, for the Immersion and Emersion, the proportion is. 1. As the Co-sine of the Latitude of ☽ in the true ☍ first found, to the Radius, so the Co-sine of the difference of the semidiameters of the Moon and shadow, to the Co-sine of the motion of half continuance in totall

 darknesse.

darkneſſe. 2. As the true hourly motion of ☽ from ☉ to one houre or 60′. ſo the Motion to the time of Half-continuance, which ſubſtracted from and added to the time of the greateſt obſcuration or middle of the Eclipſe, gives the time of the Immerſion and Emerſion or beginning and ending of totall darkneſſe.

The Obſervation of this forementioned Eclipſe of the Moon made by *Bullialdus* at *Paris* was thus, omitting ſeconds,

Anno 1659. *Octob.* 19.	*Initium penumbræ.*	13h 48′	*Alt: Marg: infer:* ☽	47°	32′
	Initium verum.	13 58	*Alt: Marg. infer.* ☽	46	24
	Finis verus.	16 37	*Alt. Cor.* ♌	39	7
	Finis penumbra.	16 43	*Alt. Cor.* ♌	40	7

Attigit digitos VII *& ultra.*

Mr *Norwood* at *Barmudos* obſerved the Beginning at 9h. 34′. the End at 12ho. 13′.

And by an obſervation of the beginning and end at *London* (though perhaps leſſe accurate) the time of the Middle was 15ho. 5′.

But for the moſt part in Lunar Eclipſes, the craſſitude of the *penumbra* neer the limits of the perfect ſhadow makes the duration and digits appear more then really they are.

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10. *To Calculate an Eclipſe of the Sun.*

AT the time of the true ☌ of ☉ and ☽, to the difference of their Horizontall Parallaxes adde the ſumme of their Semidiameters; If the Aggregate or totall ſumme ſhall exceed the true Latitude of the Moon, then in ſome part of the Earth the Sun will be Eclipſed, otherwiſe the Moon cannot Eclipſe him at that time. Again, at the time of the Viſible ☌ of the Luminaries, where the ſumme of their ſemidiameters ſhall be greater then the viſible Latitude of the Moon, ſhe will there Eclipſe the Sun, elſe not.

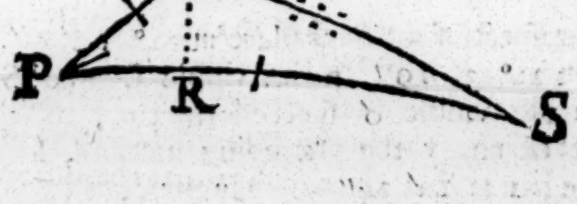
And to Calculate a Solar Eclipſe to any given place or Longitude and Latitude of the Earth;

To

To the time of the true ☌ found by the foregoing rules, with the place of the Sun (in *Tabula Ascensionum Rectarum*) seek his Right Ascension and adde thereto the apparent time converted into degrees and minutes, the summe is the Right Ascension of the Mid-heaven, and adding 90° its the Oblique Ascension of the Ascendent, which with the Latitude of the place of the Earth, gives (by Trigonometry, or Tables of Oblique Ascension, &c.) the point of the Ecliptick then rising, from which rejecting three signes, the residue is the 90th degree or highest point of the Ecliptick, the distance between which point and the place of the Sun being taken, and with the place of ☉ (*in Tabula Declinationis*) his Declination, we are next to find his distance from the Vertex and the Angle of the vertical circle with the Ecliptick, &c. as in the following Example, wherein,

Anno 1659. in *November*, the Apparent time of the true ☌ of ☉ and ☽ reduced to the Ecliptick is the 4th day 2ho. 36′. 49″. the place of the Luminaries in ♏ 22° 12′. 9″. and the true Latitude of ☽ North 46′ 5″.

Right Ascension of the Sun	229°	47′
Time from Noon in *degr:* and *min:*	39	12
Right Ascension of the Midheaven.	268	59
90th degree of the Ecliptick in the *Lat:* of 51° 32′	♐. 27	31
Distance of the Sun from the 90th degree	35	19
Declination of the Sun South.	18	22



Then Let *S* denote the Center of the Sun, *P* the North Pole of the æquator, V the vertex of London, there is given P V 38° 28′. *P S.* 108° 22′. VPS 39° 12′, and letting fall the perpendicular V R we finde (1) PR

31° 37′. therefore RS 76° 45′. and hence (2) VS 77° 50′. the distance of ☉ from the Vertex. (3) by the distance from the Vertex 77° 50′. and from the 90th degree 35° 19′. the Angle of the Verticall Circle with the Ecliptick is found 81° 13′. (4) by the dist: from the vertex and the Horizontall Parallax of ☽ 59′ 27″. her Parallax in Altitude is 58′ 7″. the Parallax of ☉ in Altitude 15″ substract, the residue is the Parallax of ☽ from ☉ in Altitude 57′ 52″. (5) by the Parallax of ☽ from ☉ in Altitude 57′ 52″. and the Angle of the Verticall Circle with the Ecliptick 81° 13′. the Parallax of ☽ from ☉ in Longitude is 8′ 50″. (6) by the same Parall; in Alt: 57′ 52″. and Angle 81° 13, the Parallax of ☽ from ☉ in Latitude is 57′ 11″.

The Operation.

		°	′		
rad.	*tan.*	38	28	9	90009
	co-sin.	39	12	9	88927
	tan.	31	37	9	78936
	co-sin.	31	37	9	93022
	co-sin.	76	45	9	36022
	co-sin.	38	28	9	89375
	VS.			19	25397
	co sin.	77	50	9	32375
	tan.	77	50	10	66635
rad.	*tan.*	35	19	19	85033
	co-sin.	81	13	9	18398

	°	′	″		
rad. sin.	77	50	0	9	99013
sin.	0	59	27	8	23786
Par. Alt. ☽. *sin.*	0	58	7	8	22799
☉			15		
☽ *à* ☉ in *Alt.*	0	57	52		
rad. tan.	0	57	52	8	22620
co-sin.	81	13	0	9	18398
in Long. tan.	0	8	50	7	41018
rad. sin.	0	57	52	8	22613
sin.	81	13	0	9	99488
in Lat. sin.	0	57	11	8	22101

Here observe that in the Orientall quadrant of the Ecliptick the Parallax in Longitude Addeth, but in the Occidentall quadrant, as in this Example, it substracteth.

Therefore in respect of the Suns place ♏ 22° 12′ 9″. the Visible Longitude of ☽ is in ♏ 22° 3′ 19″ and her visible Latitude South 11′ 6″.

And because the visible ☌ succeeds the true, to half an houre after, viz. 3h. 6′ 49″. operating by the præceding method, I finde the parallax of ☽ from ☉ in Longitude 12′ 34″ to be substracted, therefore from the true half hourly motion of ☽ from ☉ 16′ 58″. I substract the difference of the parallax in Longitude 3′ 44″. and there remaineth the visible half hourly motion of ☽ from ☉ 13′ 44″. Then as 13′ 14″. to half an hour or 30′ so is

8′

8′ 30″. to 20′ 2″. the Intervall, which added to the time of the true ☌ 2ho. 36′ 49″. the summe is the Apparent Time of the Visible ☌ 2ho. 56′ 51″.

To which time I compute again the true places of the Luminaries with the parallax of ☽ from ☉ in Longitude and *Latitude*; and the place of the Sun is ♏ 22° 13′ 0″. the Moon in her Orbite 7s 22° 26′ 19″. the Argument of *Latitude* 9° 3′ 12″. the reduction sub. 2′ 1″. the true place of the Moon reduced ♏ 22° 24′ 18″. and her *Latitude* North 47′ 8″.

The right Ascension of ☉ is 229° 47′. the time from noon in degrees and min: 44° 13′ the right Ascen. of the Midheaven 274° 0′. and hence the 90th degree in Lat. 51° 32′. ♑ 9° 38′. distant from ☉ 47° 15′. the declination of ☉ South 18° 22′. his distance from the Vertex 79° 50′. the *Angle* of the Vertical circle with the *Eclipt*ick 78° 49′. the Horizontall parallax of ☽ 59′ 28″ her parallax in Altitude 58′. 32″ from ☉ 58′. 17″. in *Longitude* 11′ 18″. in *Latitude* 57′ 11″ but her true *Latitude* is North 47′ 8″. therefore her visible *Latitude* South 10′ 3″. The Semidiameter of ☉ is 16′ 7″. of ☽ 16′ 5″ the summe 32′ 12″. the visible *Latitude* of ☽ substract 10′ 3″. the Part Deficient 22′ 9″. then as the Semid. of ☉ 16′ 7″. to 6 digits, so the Part Deficient 22′ 9″. to the Digits Eclipsed 8d 15′.

To 1 houre before the Visible ☌. *viz:* 1h 56′ 51″. the visible *Longitude* of ☽ from ☉ is in *Antecedence* 25′ 57″. and her visible *Latitude* South. 12′ 54″. exceeding the *Latitude* seen in the visible ☌. 2′. 51″. therefore (1) as sin 25′ 57″ to the Radius, so tan: 2′ 51″ to tan: 6° 16′. the *Angle* of the visible way of ☽ with the *Eclipt*ick. (2) as the Radius, to sin. 10′ 3″. so sin. 6° 16′, to sin. 1′. 6″. the motion seen from the visible ☌ to the greatest obscuration. (3) *As* co-sin. 10′ 3″ to co-sin. 1′. 6″. so co-sin. 32′ 12″ the sum of semid: to co-sin. 30′ 36″. the visible motion from the beginning of the *Eclipse* to the greatest obscuration, and from 30′ 36″. substract 1′ 6″. the residue is 29′ 30″. the motion seen from the beginning to the visible ☌. (4) *As* the Radius, to sine 29′ 30″. so the co-sine of the *Angle* 6° 16′. to sine 29′ 19″. the motion of ☽ from ☉ in *Longitude* seen from the beginning to the visible ☌. (5) as 25′ 57″. to 1 houre or 60′. so 29′ 19″, to 1h. 4′ 34″. which substracted from the time of the visible ☌ 2 h. 56′ 51″. there remaineth the time of the Beginning of the *Eclipse* 1h. 52′ 17″.

To 1 houre after the visible ☌. *viz.* 3h. 56′. 51″. the visible *Longitude* of ☽ from ☉ is in Consequence 27′ 13″. and her visible *Latitude* South 6′ 7″ being lesse then the Latitude seen in the visible ☌. 3′ 56″. therefore (1) as sin. 27′ 13″ to the Radius, so tan. 3′ 56″. to tan. 8°, 18′. the *Angle* of the visible way of ☽ with the *Eclip*tick. (2) as Radius to sin. 10′ 3″. so sin. 8° 18′, to sin. 1′ 27″. the motion seen from the visible ☌ to

the

the greatest obscuration. (3) as co-sin. 10′ 3″ to co-sin 1′ 27″. so co-sin 32′ 12″. to co-sin 30′ 37″. the visible motion from the greatest obscuration to the End; and to 30′ 37″ adde 1′ 27″. the sum is 32′ 4″. the motion seen from the visible ☌ to the End. (4) as Radius, to sin. 32′ 4″. so co-sin 8° 18′ to sin: 31′ 44″ the Motion of ☽ from ☉ in longitude seen from the visible ☌ to the End. (5) as 27′ 13″ to 1 houre: so 31′ 44″ to 1h 9′ 57″. which added to the time of the visible ☌ 2 h. 56′ 51″. the sum is the time of the end of the *Eclipse* 4h 6′ 48″.

*L*astly, the motion seen from the visible ☌ to the greatest obscuration being found to the houre before 1′ 6″ to the houre after 1′ 27″ the half sum is 1′ 16″.

The *Motion* seen from the Beginning to the visible ☌ 29′ 30″. from the visible ☌ to the End 32′ 4″. the sum is 61′ 34″.

The Time of the whole Duration from the Beginning to the End of the Eclipse 2ho 14′ 31″.

As 61′ 34″ to 2h 14′ 31″. so 1′ 16″ to 2′ 46″. in time, which (because the seen *Lat.* of ☽ is decreasing) added to the time of the visible ☌ 2h 56′ 51″ gives the time of the middle or Greatest obscuration 2h 59′ 37″.

Therefore at *London* in this Eclipse of the Sun *Anno* 1659. *November* the 4th we have by calculation

		ho.	′	″
The Apparent time of	The Beginning.	1	52	17
	The Visible ☌.	2	56	51
	The Middle.	2	59	37
	The End.	4	6	48

The Digits Eclipsed 8 and 15 min.

My worthyly respected friend Mr *Laurence Rook* Professor of *Geometry*, observed the end of this *Eclipse* at *Highgate* neer *London* just 4ho *P. M.* and the digits Eclipsed 8.

And Bullialdus at *Paris*, the Beginning at 1h. 58′. the *End* at 4h 16′. the digits *Eclipsed* a little more then 8.

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11. *For the Distance of the Centers of the Earth and Moon at all Times.*

IN the Conjunction or Opposition of the Sun and Moon (*in Tabula Logarithmorum à Terra Luna Distantiarum*) you have the *Logarithm* of her Distance from the *Earth* correspondent to her mean *Anomaly*. But at all other Times,

As

As the Sine of the Angle of Evection,
To the Chord of Evection ;
So the Sine of the Synodical Anomaly,
To the Distance of the Moon from the Earth.

Or otherwise,

As the Sine of the Synodical Anomaly, when more then 6 Signs, Correct by Addition, when less by Substraction of the Angle of Evection,

To the Distance of the Moon from the Earth answerable to the mean Anomaly of ☽.

So the Sine of the simple Synodical Anomaly,

To the true Distance of the Moon from the Earth.

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12. *By the Distance from the Earth, with the True Altitude, or distance of ☽ from the Vertex, to find her Parallax and Visible Altitude.*

From the Log. of the distance of the Moon from the Earth, substract the Log. of the Earths Semidiameter. 3. 217484. the residue is the Log. Tangent of an Arch, from which rejecting 45°.

As the Radius,

To the Tangent of the remaining Arch ;

So the Tang. of half the Complement to a Semicircle of the true Distance of ☽ from the Vertex,

To the Tang. of an Arch, the difference of which, and the said half Complement, is the Parallax of ☽ in Altitude, which substracted from the True Altitude of ☽, there will remain the Visible.

---

13. *By the Distance from the Earth, and Visible Altitude of ☽, to find her Parallax and True Altitude.*

As the Distance of the Moon from the Earth,

To the Sine of the Visible distance from the Vertex, or Cosine of Altitude seen,

So the Semidiameter of the Earth. 1650. Log. 3.217484.

To the Sine of the Parallax of ☽ in Altitude, which added to the Visible Altitude of ☽, the Sum is her True Altitude.

And having the Moons True distance from the Vertex and Parallax in Altitude, with other necessary Data, you may by Spherical Trigonometry proceed to find the Angle at the Moon of the Vertical with the Circle of

Latitude, and hence the Parallax of ☽ in Longitude and Latitude, &c. which way (though most exact) I have purposely omitted in the foregoing Example of the Suns Eclipse, as a needless trouble unto Tyroes.

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14. *For the distance of the Center of ☽ from the Eye of the Observator, or any Point of the Earths Superficies.*

As the Sine of the visible distance of ☽ from the Vertex,
To the distance of the Centers of the Earth and Moon;
So the Sine of the true distance of ☽ from the Vertex,
To the distance of her Center from the Eye of the Observator.

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15. *For the visible Semidiameter of ☽ at all Times.*

As the distance of the Center of ☽ from the Eye of the Observator,
To the true Semidiameter of ☽ 446. Log. 2.649335.
So the Radius,
To the Sine of her visible Semidiameter.

Lastly, the Table of Logistical Logarithmes at the end of this Book, serves with great ease for making these following, and such like Proportions.

If one Degree or 60′. give 58′. 23″. what shall 50′. 42″?

1. I seek 58′. in the head of the Table, under which, and over against 23″. by the side and left hand Column, I find 119. which is the Logistical Logarithm of 58′. 23″.

2. In like manner I find that the Logistical Log. of 50′. 42″. is 731.

3. Adding 119. and 731. together, the Sum is 850. for which Number (or the neerest unto it) I seek in the Table, and over 850. in the head is 49′. and by the side and left hand Column 20″. Therefore,

	′	′ ″	Log. Logist.
If	60. give	58. 23.	119
Then		50. 42.	731
shall give		49. 20.	850

So in the first Example of finding the Longitude of ☉ by our Tables, the mean Anomaly of the Earth was 1ˢ. 8°. 50′. 42″. but the sidereal Longitude of ☉ is to 1ˢ. 8°. of mean Anomaly 3ˢ. 15°. 7′. 55″. to 1ˢ. 9°. 3ˢ. 16°.

3°. 16'. 6'. 18''. the difference answerable to one Degree of middle motion is 58'. 23''. and therefore to 50'. 42''. it is 49'. 20''. which added to 3s. 15°. 7'. 55''. the Sum is 3s. 15°. 57'. 15''. the true Long. of ⊙ from the first ✱ of ♈.

But suppose the mean Anomaly of ⊖ 6s. 0°. 35'. 24''. and the Long. of ⊙ required. Here to one Degree of mean Anomaly the true Motion is 1°. 2'. 7''. I say

'	' ''	Log. Logist.
As 60. to	2. 7. ———	14525
so ———	35. 24. ———	2291
to ———	1. 15. ———	16816

And the Sum of 35'. 24''. and 1'. 15''. is 36'. 39''. the proportional sought, which added to 8s. 8°. 20'. 0''. the Sum is 8s. 8°. 56'. 39''. the sidereal Long. of ⊙.

To the mean Anomaly of Saturn, 6s. 24°. 49'. 1''. I would know his Heliocentrick Longitude.

	s. o.	s. o. ' ''
To	6. 24. it is	2. 25. 21. 23
To	6. 25. ———	2. 26. 27. 55
The Difference is		1. 6. 32

'	' ''	Log. Logist.
As 60. to	6.32 ———	9630
So ———	49. 1 ———	878
To ———	5.20 ———	10508
Adde ———	2.25.21.23	
Sum	2.26.15.44	Long. ♄ Heliocent.

To the same mean Anomaly of ♄ the Log. of his Curtate distance from the Sun is required.

	s. o	
To	6. 24. it is	5.956355
To	6. 25. ———	5.956566
The Difference ———		211

In the second row, in the Head of the Table of Logistical Logarithms, looking for 211. I find the neerest lesser Number 180. with the residue 31. in the left hand Column, and in the common Angle is the Logist.

Log. 12320. then adding thereto the Logiſt. Log. of 49′. 1″, 878. the Sum is 13198. for which I ſeek in the Table, and find the neereſt to it, 13208. and over this in the ſecond row in he head, 120. and in the left hand Column against it, 52. both put together, being 172. which (becauſe the Diſt. increaſeth) added to 5. 956355. the Sum is, 5. 956527. the Log. of the Curtate diſtance of ♄ from ☉.

		Log. Logiſt.
As 60. to 211		12320
So 49. 1″.		878
To	172	13198
	5.956355	
	5.956527. Log. diſt. ♄ à ☉ Curt.	

If 58′. 23″. give 60′. what ſhall 49′. 20″. ?

In this caſe where 60′ is put in the ſecond or third place, the queſtion is reſolved by Subſtraction, thus,

	′ ″	Log. Logiſt.
If	58. 23	119
give 60′.	49. 20	850
ſhall give	50. 42	731

If 1°. 2′. 7″. give 60′. what ſhall, 36′. 39″. ?

Here if we take the half of 1°. 2′. 7″. and alſo of 36′. 39″. the proportion is the ſame.

	′ ″	Log. Logiſt.	
If	31. 3.½	2860	Therefore
give 60′.	18. 19.½	5151	If — 1°. 2′. 7″. give 60′.
ſhall give	35. 24.	2291	36′. 39″. ſhall give 35′. 24″.

For the Log. Tangent of 83°. 47′. 34″.

° ′		
Of 83. 47.	it is	10. 962856
Of 83. 48.		10. 964031
The Difference		1175

For this purpoſe I take Minutes in the Table of Logiſt. Log. for ſeconds, and under 1140. in the ſecond row in the head, and over againſt 35. in the left hand Column, I find the Logiſt. Log. of 1175. &c.

As

		Log. Logist.
	$''$	
As 60. To	1175	4863
So 34		2467
To	666	7330

Tan. 83°. 47'. 0''—10. 962856. Adde.

Tan. 83. 47. 34.—10. 963522.

But if the Arch to the Log. Tang. 10. 963522. were required, I find in the Table of Sines and Tangents, that it exceeds the Log. Tang. of 83°. 47'. by 666. and the Difference anſwerable to one Minute, is 1175. as before. Then,

As	1175	4863
To 60''. So	666	7328
To 34.		2465

Therefore the Arch to the Log. Tang. 10.963522. is 83°. 47'. 34''.

OBSERVATIONS

OBSERVATIONS & CALCULATIONS Compared.

The Times of six Autumnal, and three vernal Æquinoxes, diligently observed by Hipparchus *at* Alexandria, *with an Armilla* (Ptol. *lib.* 3. *cap.* 1.) *were as followeth.*

The Year before Christ.	*Time by Observation at Alexandria.*	*Equal Time at London.*	*Place of* ☉ *by our Tables.*
	d	d h ′	s ° ′ ″
162—	*Sept.* 27. *about Sun setting.*	27. 3.57	♎ 0.37.52
158—	*Sept.* 27. *in the Morning.*	26.15.57	♎ 0.24.16
158—	*Sept.* 27. *at Noon.*	26.21.57	♎ 0.24.43
147—	*Sept.* 26. *at Mid-night.*	26. 9.57	♎ 0.14.40
146—	*Sept.* 27. *in the Morning.*	26.15.57	♎ 0.15. 8
143—	*Sept.* 26. *in the Evening.*	26. 3.57	♎ 0. 1.30
146—	*March.* 24. *Morn. & about* 11^h^. *A.M.*	23.20.41	♓ 29.55. 5
135—	*March.* 23. *after Mid-night.*	23.11. 0	♓ 29.51. 4
128—	*March.* 23. *about Sun setting.*	23. 3.41	♓ 29.51. 3

The chief cause of these differences, was undoubtedly the Suns Refraction, unknown to *Hipparchus*; whence in the Horizon, the true place of ☉ being ♎ 0°. 38′. he would appear exactly in the Plane of the Æquinoctial, as in the first Observation; and the neerer the Horizon, the greater the difference, as may be considered in some of the rest. But the exact Time when the Observation was made, is only related in the first Vernal Equinox, where the Armilla was on both sides equally illuminated, about the 5th. hour of the day.

The

The Calculation of the Suns place, to the Year before Christ. 146. *March the* 23. *day* 20^{ho}. 41′.

	s. °. ′ ″	s. °. ′ ″
Anno Chri. —— 1	6.23.19.56	0. 6.16. 0
Sub. —— 200	11.28.50.10	0. 2.40. 0
Ante Chri. 200	6.24.29.46	0. 3.36. 0
Adde. —— 40	11.29.46. 2	32. 0
14	11.29.25.33	11.12
Martii. ——	1.28. 9. 4	8
Die. —— 23	0.22.40. 9	3.
Ho. —— 20	49.17	
′ —— 41	1.41	0. 4.19.23. *Prac.*
Anom. Med. ⊖	9.15.21.32	
Long. ☉ *a* 1 ✱ ♈	11.25.35.42	
Præcess. Æquin.	0. 4.19.23	
Long. ☉ *ab Æqu.*	11.29.55. 5	

Anno Christi, 882. *September* the 18th. day, 13^{ho} 15′ at *Aracta*, by the careful Observations of *Albategnius* of the place of ☉ in the Meridian, was the apparent time of the Autumnal Æquinox; He likewise observed the Time from the Autumnal Æquinox to the Vernal 178. dayes, 14. hours, 30. min. But from the Vernal Æquinox to the Autumnal 186. dayes, 14. hours, 45. min. *Albategnius de Scientia Stellarum.*

The Parallax of ☉ in the Meridian was 9″. Therefore the Vernal Æquinox was 9′ of Time sooner, and the Autumnal 9′ later than observed; and hence,

Anno Christi.	*The Correct Time of the Ingress of* ☉ *at Aracta.*		*Equal Time at London.*	*Place of* ☉ *by our Tables.*
		d. h. ′	h. ′	s. °. ′ ″
882	*in* ♈ *March.*	15.22.21	18. 58	♈ 0. 0. 17
882	*in* ♎ *Septemb.*	18.13.24	10. 17	♎ 0. 0. 10
883	*in* ♈ *March.*	16. 3.36	0. 13	♓ 29. 58. 53

Anno

Anno Christi, 1290. in some Meridian passing through *France*, and neer the Longitude of *London*. The Vernal Æquinox was observed, *March* the 12th day, 16 hours.

And *Anno* 1303. *Prophatius Judaus* with other Observators, proved the Ingress of ☉ in ♈. *March* the 12th day, 20 hours. See *Astronomia Philolaica*, *Lib*. 2. *Pag*.70, & 71.

Anno 1290. at *London*. The Equal Time of the Vernal Æquinox was by our Tables, *March* the 12th day, 16 hours, 11′.

And *Anno* 1303. *March* the 12th day, 19 hours, 49′.

note And touching the Apparent Place of the Sun at all Times, we affirm, that the Fixt Sidereal Longitude of the Aphelion, as well of the Earth, as each other Primary Planet, will sufficiently appear by the most Certain Observations of all Ages, especially of these last 200 years, and shall conclude with these which follow of the Tres-noble *Tycho Brahe* at *Uraniburg*, agreeing with those of Mr. *Edward Wright* at *London*, *Anno* 1594, 1595, 1596 & 1597. as you may see in his Correction of the Errors of Navigation.

Obser-

Observations of the Suns Meridional Altitudes made at *Uraniburg* in *Denmark*, by the noble Lord of *Knudstrop*, *Tycho Brahe*, where the Altitude of the Pole is determined by himself and *Longomontanus*, 55°. 54′. 30″.

An. Dō.	Mart.	Alt. ☉ Obser.	Alt. Correct. per Paral.	Declinatio.	Loc. ☉ Obser.	E. Tab. Nostr.	Differ.
		° ′ ″	° ′ ″	° ′ ″	s ° ′ ″	s ° ′ ″	′ ″
1583.	14	35. 22. 30.	35. 22. 42	Bor. 1. 17. 12	♈. 3. 13. 41	♈. 3. 13. 12	— 0. 29
1584.	11	34. 29. 55	34. 30. 7	Bor. 0. 24. 37	♈. 1. 1. 44	♈. 1. 0. 15	— 1. 29
1585.	13	35. 10. 45	35. 10. 57	Bor. 1. 5. 27	♈. 2. 44. 11	♈. 2. 44. 28	+ 0. 17
1586.	11	34. 18. 30	34. 18. 42	Bor. 0. 13. 12	♈. 0. 33. 6	♈. 0. 31. 31	— 1. 35
1587.	12	34. 36. 15	34. 36. 27	Bor. 0. 30. 57	♈. 1. 17. 37	♈. 1. 16. 28	— 1. 9
1588.	12	34. 53. 30	34. 53. 42	Bor. 0. 48. 12	♈. 2. 0. 54	♈. 2. 1. 22	+ 0. 28
1589.	11	34. 24. 55	34. 25. 7	Bor. 0. 19. 37	♈. 0. 49. 12	♈. 0. 47. 42	— 1. 30
1590.	11	34. 18. 35	34. 18. 47	Bor. 0. 13. 17	♈. 0. 33. 19	♈. 0. 33. 19	0. 0
1593.	10	34. 1. 30	34. 1. 42	Aust. 0. 3. 48	♓. 29. 50. 28	♓. 29. 50. 8	— 0. 20
1594.	10	33. 55. 20	33. 55. 32	Aust. 0. 9. 58	♓. 29. 35. 0	♓. 29. 35. 44	+ 0. 44
1596.	11	34. 30. 45	34. 30. 57	Bor. 0. 25. 27	♈. 1. 3. 50	♈. 1. 5. 41	+ 1. 51
1597.	10	34. 2. 20	34. 2. 32	Aust. 0. 2. 58	♓. 29. 52. 34	♓. 29. 51. 56	— 0. 38
	Sept.	° ′ ″	° ′ ″	° ′ ″	s ° ′ ″	s ° ′ ″	′ ″
1583.	13	34. 13. 20	34. 13. 32	Bor. 0. 8. 2	♍. 29. 39. 51	♍. 29. 38. 49	— 1. 2
1584.	12	34. 18. 55	34. 19. 7	Bor. 0. 13. 37	♍. 29. 25. 51	♍. 29. 24. 32	— 1. 19
1585.	10	35. 11. 40	35. 11. 52	Bor. 1. 6. 22	♍. 27. 13. 30	♍. 27. 12. 30	— 1. 0
1586.	13	34. 7. 0	34. 7. 12	Bor. 0. 1. 42	♍. 29. 55. 44	♍. 29. 55. 55	+ 0. 11
1587.	12	34. 37. 0	34. 37. 12	Bor. 0. 31. 42	♍. 28. 40. 30	♍. 28. 41. 42	+ 1. 12
1588.	12	34. 18. 20	34. 18. 32	Bor. 0. 13. 2	♍. 29. 27. 19	♍. 29. 26. 21	— 0. 58
1589.	9	35. 35. 0	35. 35. 12	Bor. 1. 29. 42	♍. 26. 14. 55	♍. 26. 15. 28	+ 0. 33
1590.	22	34. 30. 15	34. 30. 27	Bor. 0. 24. 57	♍. 28. 57. 26	♍. 28. 57. 47	+ 0. 21
1592.	10	35. 5. 5	35. 5. 17	Bor. 0. 59. 47	♍. 27. 30. 2	♍. 27. 30. 22	+ 0. 20
1594.	13	34. 6. 20	34. 6. 32	Bor. 0. 1. 2	♍. 29. 57. 25	♍. 29. 58. 31	+ 1. 6
1596.	14	33. 30. 10	33. 30. 22	Aust. 0. 35. 8	♎. 1. 28. 7	♎. 1. 27. 21	— 0. 46
	April.	° ′ ″	° ′ ″	° ′ ″	s ° ′ ″	s ° ′ ″	′ ″
1582.	27	50. 52. 0	50. 52. 10	Bor. 16. 46. 40	♉. 16. 22. 43	♉. 16. 21. 33	— 1. 10
1583.	26	50. 30. 45	50. 30. 55	16. 25. 25	♉. 15. 9. 30	♉. 15. 9. 41	+ 0. 11
1584.	30	51. 48. 30	51. 48. 40	17. 43. 10	♉. 19. 45. 14	♉. 19. 44. 44	— 0. 30
1585.	26	50. 39. 20	50. 39. 30	16. 34. 0	♉. 15. 38. 54	♉. 15. 39. 31	+ 0. 37
1586.	27	50. 52. 30	50. 52. 40	16. 47. 10	♉. 16. 24. 28	♉. 16. 23. 23	— 1. 5
1587.	29	51. 20. 35	51. 20. 45	17. 15. 15	♉. 18. 3. 39	♉. 18. 5. 0	+ 1. 21
1588.	27	51. 0. 20	51. 0. 30	16. 55. 0	♉. 16. 51. 51	♉. 16. 53. 12	+ 1. 21
1596.	26	50. 45. 30	50. 45. 40	16. 40. 10	♉. 16. 0. 10	♉. 15. 59. 2	— 1. 8
	Julij.	° ′ ″	° ′ ″	° ′ ″	s ° ′ ″	s ° ′ ″	′ ″
1582.	28	50. 40. 35	50. 40. 45	Bor. 16. 35. 15	♌. 14. 16. 48	♌. 14. 17. 26	+ 0. 38
1584.	28	50. 31. 15	50. 31. 25	16. 25. 55	♌. 14. 48. 47	♌. 14. 47. 9	— 1. 38
1586.	27	50. 56. 30	50. 56. 40	16. 51. 10	♌. 13. 21. 35	♌. 13. 21. 42	+ 0. 7
1587.	27	51. 0. 50	51. 1. 0	16. 55. 30	♌. 13. 6. 24	♌. 13. 7. 47	+ 1. 23
1589.	29	50. 18. 15	50. 18. 25	16. 12. 55	♌. 15. 32. 54	♌. 15. 32. 38	— 0. 16
	Junij.	° ′ ″	° ′ ″	° ′ ″			
1586.	12	57. 35. 36	57. 35. 44	Bor. 23. 30. 14			
1587.	14	57. 34. 30	57. 34. 38	23. 29. 8			
1593.	11	57. 35. 0	57. 35. 8	23. 29. 38			
	Decem.	° ′ ″					
1589.	15	10. 44. 48					
1590.	10	10. 43. 15					
1594.	11	10. 41. 10					

21 Lunar Eclipses, of which 19 were Observed by the Ancient *Babylonian* Astronomers, *Hipparchus*, and *Ptolomy*; related by *Ptol. Lib.* 4. the two last by *Albategnius*, the first at *Aracta*, the second at *Antioch*.

Years before Christ	Equal Time at London. M.D.H. ′	True Place of the Sun. s ° ′ ″	Distance of ☉ from ☊. s ° ′ ″	Mean Anom. of ☽. s. ° ′ ″	☽ In her Orbite Comput. s ° ′ ″	Diff. from Obs. ′ ″	Dig. Ob-ser-ved.	Dig. and Min. Com
721	Mar.19. 6.24	♓21.48.41	6. 1.28.39	2. 3.47.42	♍21.55.24	−12.57	Total.	18.
720	Mar. 8. 8.57	♓10.54.19	6. 9 19.24	0.10.11.20	♍11. 3.23	+11. 9	3. A	1.
720	Sep. 1. 5.45	♍ 1.16.27	0. 9. 3.30	5.10.56.59	♓ 0.46.14	−28.11	6.p.B	5.
621	Apr.21.14.36	♈24.50.48	11.20.29.12	11. 8. 2.58	♎25. 6.49	+13.53	3. A	1.
523	Jul. 16. 8 10	♋16.59.34	5.22.40.13	0.26.16.36	♑16.31. 7	−30. 6	6. B	5.
502	Nov.19. 8.27	♏21.50. 9	11.20.21.26	0. 1. 4. 8	♉21.58.36	+ 6.17	3. A	0.
491	Apr. 25. 7.56	♈28.56.12	11.19.13. 5	3. 8.23.15	♎28.52.32	− 6. 4	2. A	0.
383	Dec.22.16.15	♐26.57.12	5.18.57.37	7.16. 6.51	♊26 47.11	−12.28	βρα-	0.
382	Jun 18. 6. 8	♊20.59.43	11.22.24.13	0.26.10.28	♐20.47.32	−13.54	χύτι	5.
382	Dec. 12. 7.53	♐16. 9 12	5.26.56 29	5.29.37.47	♊16. 9.31	− 0.23	Total.	16.
201	Sep.22. 4.58	♍26. 9. 4	11.23.36. 1	9.29. 7.33	♓26.18.58	+ 8.27	7. A	8.
200	Mar.19.11. 3	♓25.41.51	6. 2.35. 8	3.18. 0.18	♍25.52.51	+11.35	Total.	17.
200	Sep 11.12.17	♍15.18.31	0. 1.31.11	8. 8. 6.51	♓15. 3. 3	−15. 7	Total.	19.
174	Apr.30.11.55	♉ 6. 5. 2	0. 8. 3.57	5.12.19.19	♏ 6. 3.54	+ 0.41	7. B	7.
141	Jan. 27. 7.33	♒ 4.36 15	6. 9.55.38	5.27.11.15	♌ 4.37.32	+ 3.30	3. A	3.
of Ch.								
125	Apr. 5. 6 1	♈14.30.24	11.19 7. 9	8.10.58.57	♎14.21.51	−10.58	2. A	0.
133	maij.6. 8.50	♉14.32.13	5.25.32. 3	10.13.25.19	♏14 42. 1	+ 8.47	Total.	12.
134	Oct.20. 8.47	♎26.19.55	0. 5.30. 5	2. 3.58. 4	♈26.20.51	+ 2.11	10. B	10.
136	mar. 5.13.46	♓14.49.23	5.20.35.14	4.25.18 14	♍15.17.26	+25.57	6. B	4.
883	Jul. 23. 4.59	♌ 4. 6.56	0. 5.46.20	3.23.42.23	♒ 4. 5.51	+ 0.14	11. B	10.
901	Aug. 2.12.35	♌14.39. 3	0. 5. 2 10	3.20.46.56	♒14.43.53	+ 5.58	Tot.fer	12.

The

The Place of the Moon Computed in 21 Eclipses Observed by *Tycho Brahe* at *Uraniburg*. *Progymn. Pag.* 67. and 1 of *Longomont*. at *Hafnia*.

	Anno Dom.	T. Æq. Lōdin. M.D.H ′	Loc. ☉ verus s. °. ′. ″	Dist. ☉ a ☊ s. ° ′. ″	Anom ☽ med. s. °. ′. ″	☽ in Orb. Comp. s. °. ′. ″	Dif. ab Obs. ′. ″
Uranib.	1573	Dec. 8. 7.13	♐26.50. 3	6. 1.51.58	7.25. 4.45	♊26.53 9	+ 3.31
	1576	Oct. 7.10.42	♎24.33.52	5.24.21.37	2. 6.10.18	♈24.28 9	− 7. 0
	1577	Apr. 2. 7.46	♈22.40.38	0. 1 50.23	7 7. 4 39	♎22.42.32	+ 2.19
	1577	Sept.26 12 17	♎13.27.18	0. 2. 0. 2	0.12 2.21	♈13.20 3	− 6.48
	1578	Sept.15 12.34	♎ 2.21.56	6. 9.39 29	10.17.11.56	♈ 2.23.43	+ 3.57
	1580	Ian.31. 9.24	♒21.24 27	11.26 19.45	1.17. 9.48	♌21.17. 0	− 8.17
	1581	Ian.19. 9 12	♒10. 1. 2	0. 2 41. 7	11 22 3 .35	♌ 9.59 45	− 0.40
	1581	Iul. 15.16.20	♌ 2.44.52	6. 4.48.18	4.28.26.43	♒ 2.48.41	+ 4.54
	1584	Nov. 7.12.18	♏25.51.18	0. 2. 1.57	4.7 .56.57	♉25.52.37	+ 1.47
	1587	Sept. 6. 8.36	♍23.11.36	11.24. 3.59	10. 2. 4. 0	♓23.17. 4	+ 4. 7
	1588	mar. 2.14. 7	♓22.44. 8	6. 3. 2.48	3.20.38.13	♍22.44.46	+ 1.20
	1590	Dec.30. 6.10	♑19. 6.19	5.24. 6. 7	9 12.26.27	♋19.12.46	+ 5. 6
	1592	Iun. 14. 9.27	♋ 3.14.37	0. 5.25.13	1. 4.48. 4	♑ 3. 4.45	− 8.39
	1592	Dec. 8. 6.51	♐27.12.45	6. 9.45 24	6. 5 53.18	♊27.15.23	+ 4.49
	1594	Oct. 18.18.34	♏ 5.31.41	5.24. 2.50	2. 3 23.34	♉ 5.27. 3	− 5.59
	1595	Apr.13 15.30	♉ 3 .20 48	0. 1.14.23	7. 4.13.34	♏ 3.18.35	− 1.56
	1595	Oct. 7 19.39	♎24.19.48	0. 1.36.19	0. 8.59.17	♈24.11.59	− 7.27
	1596	Apr. 2. 8.24	♈23. 5.28	0. 9.46. 5	5.18.25.53	♎23.11.56	+ 8.39
	1598	Feb. 10.17.18	♓2 .27. 6	11.25. 6.17	1.14.24.10	♍ 2 20.55	− 7.18
	1598	Aug. 6. 7. 2	♌23.22.13	5.25.22.27	6.11.18.58	♒23.26. 6	+ 2.50
	1599	Ian. 30.17. 4	♒21 6.45	0. 2.30.42	11.19.16.52	♌21. 6.51	+ 0.40
Hafnia.	1609	Iul. 6.11.31	♋24.10.41	11.27.19.34	2.23.51.34	♑ 24.11.46	+ 0.29

The

The Calculation of the Place of ☽ in 18 Eclipses Observed by *Gassendus, Langrenus, Hevelius, Ricciolus, Bullialdus* and others at the vndernamed Places.

Locus. Obser.	Anno Dom.	T. Æq. Londinens. M.D. H.′	Loc. ☉ verus. s. °. ′. ″	Dist. ☉ à ☊ s. °. ′. ″	Anom. ☽ med. s. °. ′. ″	☽ in orb. Comp. s. ° ′. ″	Diff. ab Obser. ′. ″
Aquæ.Sextiæ.	1620	Jun. 4.12.47	♊ 24. 3.59	5.28.17.56	10.21.35.12	♐ 24. 7.20	+ 2.58
Bruxells.	1624	Sept.16. 8. 1	♎ 4. 0. 4	0. 1. 5.57	8. 5.41.47	♈ 4. 1.22	+ 1.33
Paris.	1625	Mar.13.12.57	♈ 3.36.53	6.10. 8.58	1.23.56.58	♎ 3.29. 3	− 5.34
Aquæ.Sextiæ.	1628	Jan. 10. 9.21	♒ 0.27.42	6. 1.41.30	7.18. 7.17	♌ 0.31.44	+ 4.25
Bruxels.	1630	Nov. 9.10 39	♏ 27.38.33	5.23.37.54	1.28. 1.32	♉ 27.37.44	− 2.16
Tubing.	1631	Oct. 29.11. 1	♏ 16.17.45	6. 1 1.56	0. 3 13.50	♉ 16.15.16	− 2.15
Dinia.	1634	Mar. 4. 8 39	♓ 24.20.36	11.24.27.28	1. 8.38. 9	♍ 24.16.22	− 5.30
Aquæ.Sextiæ.	1635	Feb. 21. 8. 20	♓ 13. 7.38	0. 1.59.14	11.13.28. 8	♍ 13. 6.27	− 0.44
Paris.	1635	Aug 17.14 56	♍ 4.20.59	6. 2.35.50	4.19.33.51	♓ 4.15.51	− 4.33
Dinia.	1636	Feb.10.10.16	♓ 1.56. 7	0. 9.32.44	9.19.31.36	♍ 1.55.19	+ 1.20
Bruxells.	1638	Dec.10.14. 1	♐ 29.23. 0	0. 1.45.29	4. 0.45.52	♊ 29.18.54	− 3.42
Dantzick.	1641	Oct. 8. 7.10	♎ 25.38.59	11.22.42.46	9.23 10. 1	♈ 25.42.41	+ 2. 2
Bononia.	1642	Apr. 4.13.37	♈ 25. 6.54	6. 1.37. 7	3.12.14.46	♎ 25. 6.53	+ 0.21
	1642	Sep.27.15.57	♎ 14.50. 9	0. 0.39.53	8. 2 57.14	♈ 14.49.58	− 0. 2
	1643	Sep.17. 6.46	♎ 4.20.20	0. 8.56.49	6.16. 1.29	♈ 4.19. 9	+ 0.49
Paris.	1645	Jan.31. 7. 0	♒ 22.32.34	5.23.44. 6	9. 4.46.31	♌ 22.37.21	+ 3.22
Dantzick.	1647	Jan 10. 9.19	♒ 0.51.13	6. 9.35.47	5.29. 6.45	♌ 0.52.10	+ 3. 6
	1654	Aug 17.10.57	♍ 4.34.32	6.10.19.38	2.28.24.17	♓ 4.29.18	− 2.56

Eclipses of the Sun, and Diameters of ☉ and ☽ observed.

Anno 1567. *April* the 9th day, even about Noon, *Christopher Clavius* at *Rome* observed the whole body of the Moon interposed between the Sun and his sight, so that there appeared a bright Circle of the body of the Sun encompassing the Moon on all parts. *Clavius in Sphær. Io. de Sacro Bosco* pag. 594. *Edit. postr.*

The Apparent time of the Visible ☌ of ☉ and ☽ at *Rome*, was by our Tables, *April* the 9th day, 0^h. 5′. 30″. The Mean Anomaly of ☽. 3^s. 7°. 21′. 49″. The Argument of her Latitude, 5^s. 24°. 49′. 35″. The True Longitude of the Sun, and Visible Place of ☽. ♈. 28°.34′.45″. The Latitude of ☽. seen 0′. 3″. North. The True Semidiameter of ☉. 15′. 49″. The Visible Semidiameter of ☽. 15′. 38″. Therefore the remaining Circle or Ring of the Sun, was on the North part 8″. and on the South part 14″.

Anno 1621. *May* the 11th, *Gassendus* at *Aqu. Sextia*, Observed an Eclipse of the Sun, his Altitude at the Beginning 25°. 30′. h. 7. 5′. 32″ *A. M.* at the End 51°. 17′. h. 9. ′31. The Digits Eclipsed 9 and 23′.

Anno 1630. *May* the 31th, *Gassendus* at *Paris* Observed the Beginning of the Suns Eclipse at 6^h. 16′. the Middle at 7^h. 12′. *P. M.* the Digits 11 and 32′.

Dr. *Bainbridge* at *Oxford*, the Beginning at 5^h. 58′. the End at 7^h. 48′.

Anno 1633. *May* the 29th day, 3^h. 18′. was the Beginning of a Solar Eclipse Observed at *Paris*.

Anno 1639. *May* the 22th day, 4^h. 1′. 46″. *P. M.* by Observation at *London*, was the Beginning of an Eclipse of the Sun, the End at 6^h. 10′. 27″. The Digit, 9. 24′. of which, and the 3 next here following, observed at *London*, you may see Dr. *Twisden's* Miscellanies. *Bulliadus* at *Paris* observed the Beginning of this Eclipse at 4^h.21′. The Middle 5^h.27′. The End 6^h. 25′.

Anno 1645. *August* the 11th at *London*, The Beginning of the Sun's Eclipse was by Observation at 9h. 53′. Inclining 25°. from the Supream Point of his Visible Periphery to the West. At 10h. 49′ the Digits were 5. and afterwards 5. $\frac{4}{10}$.

Anno 1649. *October* the 25th at *London*, The Beginning of a Solar Eclipse was observed at 0^h. 41′. $\frac{1}{2}$. The Middle 1^h. 36′. The End 2^h. 36′. $\frac{1}{2}$. The Digits 4. $\frac{1}{2}$.

Anno 1652. *March* the 29th at *London*, 10^h. 29′. by Observation was the Middle of an Eclipse of the Sun. And Mr. *William Leybourn* observed the End at 11^h. 42′. but by Dr. *Twisden* the Middle was at 10^h. 33′. and End 11^h. 46′. The Digits eclipsed 11.

Bullialdus and several others at *Paris* Observed the Beginning at 9^h.30′. the End at 11^h. 50′. the Digits eclipsed were by the Observation of *Bullialdus* 10°. 25′. Of *Io. Bechet*, Math. Professor, D. *Picart* and others, 11. 28′.

Gassendus at *Dinia* Observed the Beginning at 9^h. 43′. the Middle 10^h. 51′. and the End (of which he was less confident) 11^h. 58′. the Digits 9.24′. the Semi-diameter of ☉ 15′. 20″. of ☽ 15′. 50″. that is as 1000 to 1033.

Hevelius at *Dantzick* Observed the Beginning at 11^h. 3′. 21″. the Middle 12^h. 10′. 35″. the End 1^h. 19′. 2″. the Digits 9. $\frac{3}{8}$. and the proportion of the Semidiameter of the Sun to the Semidiameter of ☽ as 1000 to 1033. with which our Tables do exactly agree.

Anno 1654. *August* the 2d day at *London*, by the Observation of Mr. *William Leybourn*, The Middle of the Eclipse of the Sun was at 9^h. 4′. $\frac{1}{2}$. *A.M.* the End 10^h. 16′. the Digits 10. $\frac{1}{3}$. or 10. $\frac{1}{5}$. Mr. *Lawrence Rook*

Observed

Observed the Digits 10. $\frac{1}{6}$. and Dr. *Wybard* took the Altitude of ☉ at the End of this Eclipse 48° precisely, 10ʰ. 17′. Dr. *Wallis* at *Oxford* Observed the Beginning at 7ʰ. 45′. the End 10ʰ. 14′. the Digits 10. *Hevelius* at *Dantzick* 7ʰ. 34′. 36″. Observed the Digits Eclipsed 10, and a little more; the End of the Eclipse 9ʰ. 25′. 15″. the Semidiameter of the Sun, 15′. 41″. $\frac{1}{3}$. of the Moon, 15′. 53″. $\frac{1}{3}$. and by our Tables the Semid. of ☉ was 15′. 43″. of ☽ 15′. 55″.

Anno 1656. *January* the 16th, *Hevelius* at *Dantzick* Observed the Beginning of the Eclipse of ☉ at 1ʰ. 51′. *P. M.* and about the Middle at 3ʰ. 11′. the Digits a little lesse then 7. the Semidiameter of ☉ 16′. 13″. of ☽ 14′. 20″. By our Tables the Semidiameter of ☉ was then 16′. 10″. of ☽ 14′. 20″.

Anno 1661. *March* the 20th, *Hevelius* at *Dantzick* Observed another Eclipse of the Sun, the Beginning at 10ʰ. 13′. 15″. the Middle 11ʰ. 20′. the End 12ʰ. 27′. 3″. the Digits 7. 52′. the Semidiameter of ☉ 15′. 54″. of ☽ 16′. 34″. which our Tables give 15′. 54″. and 16′. 31″.

The farther tryal of the near agreement of our Numbers with these and other Careful Observations of Solar Eclipses we shall here leave unto others.

But touching the Apparent Diameter of the Moon at all Times, *Riccilus* in his New *Almagest*, Tom. 1. Part 1. Pag. 230. besides the Concordant Observations of *Gassendus* and *Langrenus*, relates his own, by which he finds the Diameter of the *Apogæon* Moon in the Quarters between 28 and 27′, Of the *Apogæon* Full Moon 29′ or 28′ $\frac{1}{2}$, Of the *Perigæon* Full Moon 34′ at most, and oftentimes lesse; Of the *Perigæon* Moon in the Quarters between 35 and 34′, but this alwayes evidently greater then in the *Perigæon* Full Moons: And by our Lunar Theory and Tables, in respect of the Earths Center,

The *Apparent Diameter* of ☽ is

	′	″
In *Apogæon* and □ to ☉.	27.	31.
In *Apogæon* and ☌ or ☍ to ☉.	28.	38.
In her Mean distance from ⊖.	30.	40.
In *Perigæon* and ☌ or ☍ to ☉.	33.	0.
In *Perigæon* and □ to ☉.	34.	38.

And

And now concerning the Secondary Inequality of the Moon, *&c.* The Equal Times at *London*, with the Calculation by our Tables, to 23 Obſervations of *Tycho Brahe*, *Gaſſendus*, and *Bullialdus*, are theſe.

Anno. Menſ.	D. H. ′	Loc. ☉ verus	Anom ☽ med.	Loc. ☽ Comput.	Loc. ☽ Obſer.	Differ.
		s ° ′ ″	s ° ′ ″	s ° ′ ″	s ° ′	′ ″
1586. Sept.	22. 14. 24	♎. 9. 24. 15	2. 5. 32. 36	♊. 7. 24. 24	♊. 7. 25	+ 0. 36
1587. Jan.	9. 6. 14	♑. 29. 15. 56	1. 15. 10. 52	♊. 0. 50. 10	♊. 1. 0	+ 9. 50
1587. Jan.	15. 14. 21	♒. 5. 42. 39	4. 7. 59. 22	♌. 25. 40. 18	♌. 25. 38	− 2. 18
1587. Aug.	17. 18. 45	♍. 4. 8. 16	1. 16. 17. 31	♊. 26. 16. 32	♊. 26. 21	+ 4. 28
	10. 3. 10	♐. 28. 36. 3	0. 27. 27. 14	♈. 6. 49. 33	♈. 6. 47	− 2. 33
	11. 4. 17	♐. 29. 40. 6	1. 11. 7. 35	♈. 19. 22. 24	♈. 19. 20	− 2. 24
	14. 7. 46	♑. 2. 52. 41	2. 22. 13. 3	♉. 29. 0. 48	♉. 29. 5	+ 4. 12
	15. 9. 8	♑. 3. 57. 25	3. 6. 1. 36	♊. 13. 11. 43	♊. 13. 13	+ 1. 17
	19. 15. 3	♑. 8. 17. 26	5. 1. 30. 27	♌. 13. 49. 36	♌. 13. 49	− 0. 36
1594. Dec.	20. 17. 13	♑. 9. 24. 10	5. 15. 45. 8	♌. 29. 42. 55	♌. 29. 44	+ 1. 5
	21. 17. 43	♑. 10. 26. 40	5. 29. 5. 21	♍. 14. 27. 16	♍. 14. 28	+ 0. 44
	22. 18. 49	♑. 11. 30. 42	6. 12. 45. 10	♍. 29. 20. 37	♍. 29. 27	+ 6. 23
	25. 20. 54	♑. 14. 39. 40	7. 23. 4. 56	♏. 11. 59. 17	♏. 12. 3	+ 3. 43
	26. 21. 16	♑. 15. 41. 48	8. 6. 20. 49	♏. 25. 34. 29	♏. 25. 25	− 9. 29
1623. Jun.	25. 9. 26	♋. 13. 14. 35	4. 20. 17. 19	♎. 18. 35. 38	♎. 18. 33	− 2. 38
1627. Jun.	7. 10. 1	♊. 26. 9. 14	9. 3. 22. 56	♌. 24. 54. 22	♌. 24. 52	− 2. 22
1634. May.	30. 7. 33	♊. 18. 43. 22	3. 4. 41. 27	♏. 27. 20. 16	♏ 27. 22	+ 1. 44
1634. Dec.	20. 5. 47	♑. 9. 12. 33	7. 28. 59. 11	♉ 24. 19. 51	♉. 24. 17	− 2. 51
1638. Jan.	14. 7. 10	♒. 5. 2. 24	4. 5. 51. 42	♉. 25. 8. 46	♉. 25. 1	− 7. 46
1641. Apr.	3. 7. 43	♈. 24. 8. 9	11. 27. 14. 55	♊. 3. 54. 16	♊. 3. 51	− 3. 16
1641. Iun.	10. 9. 39	♊. 29. 34. 54	5. 16. 43. 14	♏. 28. 14. 40	♏ 28. 10	− 4. 40
1641. Iun.	14. 10. 56	♋. 3. 26. 34	7. 9. 40. 43	♑. 29. 22. 20	♑. 29. 28	+ 5. 40
1643. Sept.	23. 14. 20	♎. 10. 34. 12	9. 8. 32. 2	♋. 3. 33. 37	♋. 3. 37	+ 3. 23

The firſt 14 of theſe Obſervations being *Tycho*'s were all in or not farre from the 90th degree of the Ecliptick; the other 9 of *Gaſſendus* and *Bullialdus*, are gathered by applications of the Moon to fixt Starrs and her viſible Longitude and Latitude correct by Parallax.

In

In the Observation of 1627. *June* the 7th $10^h. 30'$. Temp. App. at *Dinia*, The Moon began to cover and Eclipse *Cor* ♌, not much above a quarter of the dark Semicircle from her lower horn. The Equation of the Nodes was by our Tables $1°. 36'. 18''$. Subtr. The Argument of Latitude $0^s. 16°. 8'. 52''$. The True Latitude of ☽ $1°. 26'. 50''$. *Bor.* Observed $1°. 26'. 20''$.

1638. *Janu.* the 14th $8^h. 1'$. T. A. at *Dinia*, when the upper limb of the Moon covered the Brightest of Pleiades, the Equation of the Nodes was $1°. 15'. 4''$. Adde, the Argument of Latitude $4^s. 8°. 39'. 46''$. and the true Lat. of ☽ Computed $4°. 6'. 2''$. *Bor.* Observed $4°. 6'. 50''$.

1641. *April* the third day $8^h. 8'$. T. A. at *Paris*, The Moon entred upon the Northern Eye of ♉, $\frac{2}{5}$ parts of the Obscure Semicircle from her inferior horn. The Equation of the Nodes was $1°. 43'. 36''$. Subtr. The Argument of Lat. $6^s. 22°. 49'. 19''$. The true Lat. of ☽ Computed $1°. 59'. 9''$. *Aust.* Observed $2°. 0'. 20''$.

By which 3 Latitudes and some other, the Variation of the Nodes of ☽ will best appear.

For the Precession of the Æquinox, with the true Motion of ♄, ♃, ♂, ♀, ☿.

In the year before Christ, 283. *January* the 29th in the end of the third hour of the night, *Timocharis* diligently Observed the Southern middle of the Moon falling upon the third and middle Star of the Pleiades. *Ptol. lib. 7.*

The Equal Time at *London* was $6^h. 29'$. the Place of ☉. by our Tables in ♒ $6°. 5'. 43''$. the true place of ☽ ♈. $29°. 38'$. with Latitude North $3°. 56'$. but her Visible place at *Alexandria* ♈ $28°. 53'$. with Lat. North $3°. 50'$. the middle Star of Pleiades in ♈ $29°. 16'. 40''$. in Lat. North $4°. 1'$. therefore, however the Observation was made, the Visible Lat. of ☽ was certainly less then the Lat. of the Star; and by our Calculation she was then under, and her upper limb very neer the Star, soon after covering it.

Anno Ante Christum, 229. *March* the second, in the beginning of the night, ♄ appeared 2 digits under the following Star in the left wing of ♍. The time at *London* is 5^h. the sidereal Longitude of ☉ Computed $11^s. 4°. 33'. 54''$. The mean Anomaly of ♄ $9^s. 1°. 58'. 0''$. his Geocentrick Place $5^s. 7°. 16'. 50''$. and his Lat. North $2°. 41'. 21''$. the Place of the Star $5^s. 6°. 58'. 30''$. with Lat. North $2°. 50'$. therefore the Distance was $20'$. which by reason of the contraction of the eye might well seem 2 digits.

In

In the year of Chriſt, 138. *December* the 22th. juſt 8^{h}. P. M. ♄ was Obſerved by *Ptol.* at *Alexandria* about half a degree in Conſequence from the Moon. The Equal time at *London* was 5^{h}. 47′. the true Place of ☉ in ♑ 0°. 18′. 47″. of ☽ in ♒ 11°. 14′. 20″. and her Lat. South 1°. 8′. 20″. but by correction of Parallax at *Alexandria*, her Viſible place was ♒ 10°. 14′. 44″. with Lat. South 1°. 26′. 40″. The mean Anomaly of ♄ 2^{s}. 14°. 26′. 17″. his Geocentrick Long. from the Æquinox ♒ 11°. 19′. 19″. and his Lat. South 1°. 37′. 57″. and in regard the Moon was in or very neer ſetting in the Horizon, and ♄ 1 degree higher, ſhe was about 8′ more refracted, ſo that the Viſible Diſtance of their Centers in Longitude was not above 56 or 57′. which commonly by eſtimation of the eye ſeems about half a degree.

Bullialdus in his *Aſtron. Philolaica, Lib. 6. Pag.* 246 & 247. relates an application of ☽ to ♄, Obſerved in the year of Chriſt, 503. *Febr.* the 21th at night; in which, neer about the 4th hour the Moon hid the Star of ♄, but after ♄ was fully freed from the interpoſition of ☽, the Obſervator together with his loving Brother found the temporal hours by an Aſtrolabe $5.\frac{3}{4}$. ſo as they conjectured a Central ☌ of ♄ and ☽ about the 5th hour, for he appeared to emerge in the middle of the enlightened part of her circumference, &c.

Another of ☽ to *Palilicium, Lib. 3. Pag.* 172. *Anno Chriſti*, 509. *March* the 11th, after the going down of twilight, the Moon was ſeen following the Clear Star of Hyades at moſt half a digit. but ſhe ſeemed to hide him. The Star was applyed to the part by which the illuminate limb of the Moon was biſected. Then was the Moon according to true Motion in ♉ 16°. 30′.

Theſe and ſome other notable Obſervations, beſides thoſe related by *Ptolomy*, *Bullialdus* found in an antient Greek Manuſcript in the Kings Library, as you may ſee in *Aſt. Philolaica, Lib. 7. Pag.* 278. but the particular Place where either of theſe two applications of ☽ were Obſerved is not ſignified in the ſaid Manuſcript, or otherwiſe certainly known, and though *Bull.* ſuppoſeth them at *Athens*, it is moſt probable that they were both in ſome other Meridian at leaſt 2 hours more to the Eaſt. but if we compute unto *Athens*; then by our Tables,

Anno Chriſti, 503. *Febr.* the 21th, the time of the Obſervation by the Aſtrolabe, Equated and reduced unto *London* is 10^{h}. 9′. The true place of the Sun in ♓ 4°. 46′. 39″. and the Moon in ♋ 7°. 2′. 45″. her Lat. North 4′. 49″. but according to Parallax, her Viſible Place at *Athens* is in ♋ 6°. 30′ with Lat. South 0°. 18′.

The mean Anomaly of ♄ 6^{s}. 25°. 17′. 35″. his Geocentrick Long.

from the Æquinox, ♋ 4°. 15′. 39″. and his Lat. North, 11′. 56″.

Anno Christi, 509. *March* the 11th, about an hour and an half after Sun setting at *Athens*, the Equal Time at *London* is 5h. 40′. the true Place of the Sun in ♓ 22°. 57′. 43″. and of the Moon in ♉ 21°. 34′. 28″. her Lat. South 5°. 0′. 37″. but her Visible place at *Athens* in ♉ 20°. 58′. with Lat. South 5°. 13′. the Place of the Star ♉ 19°. 38′. and his Lat. South 5°. 30′.

Here note that in *Ast. Phil.* Pag. 172. in the last 6. lines there is a mistake in the Place of ☽, her Longitude being by the Tables of *Bull.* at least 1°. more then is there computed.

Anno Christi, 1514. *Febr.* the 23th day, 16h. reduced unto *London*. *Nicolas Copernicus* observed ♄ in a right line with the second and third brighter Stars in the front of ♏.

The Latitude of ♄ was then 2°. 14′. North, and hence his Longitude by Observation 6s. 28°. 51′. ferè.

The Sidereal Place of ☉ by our Tables 10s. 18°. 21′. 5″. The mean Anomaly of ♄ 10s. 20°. 53′. 29″. his Geocentrick Longitude 6s. 28°. 43′. 47″. and his Lat. North 2°. 13′. 53″.

Anno Christi, 508. *Sept.* the 26th 14h. when ♃ appeared in ☌ with *Cor Leonis* and 3 digits more Northerly.

The True Longitude of ☉ (a 1 ✱ ♈) was 5s. 22°. 44′. 58″. The mean Anomaly of ♃ 10s. 3°. 34′. 5″. his Geocentrick Place 3s. 26°. 43′. 23″. and his Lat. North 46′. 57″. but the place of *Cor Leonis* is 3s. 26°. 40′. with correct Lat. North 27′. 20″. therefore the Distance of their Centers was 20′. which by bare ocular estimation exceeds not 3 digits.

Anno Christi, 498. *May* the first day neer 7h. reduced to *London*. ♂ was seen so conjoyned with ♃ that there was no interval between them. The True Longitude of ☉ was 0s. 29°. 20′. 6″. The mean Anomaly of ♃ 11s. 17°. 42′. 32″. his Geocentrick Place 4s. 18°. 31′. 34″. with Lat. North 1°. 25′. 30″. The mean Anomaly of ♂ 2s. 3°. 7′. 47″. his Geocentrick Place 4s. 18°. 32′. 28″. with Lat. North 1°. 16′. 22″. The Difference of Longitude is 0′. 54″. of Lat. 9′. 8″. at which small Distance, to the bare eye they might well seem to have no interval or space between them.

Anno Christi, 509. *June* the 13th about 7h. in respect of our Meridian ♂ almost touched ♃, so that he seemed distant from him in antecedence 1 digit, but to the South 2 digits.

The True Longitude of ☉ was 2s. 10°. 34′. 32″. The mean Anomaly of ♃ 10s. 25°. 8′. 53″. his Geocentrick Place 3s. 29°. 47′. 35″. his Lat. North 1°. 2′. 16″. The mean Anomaly of ♂ 1s. 1°. 13′. 2″. his Geocentrick Place 3s. 29°. 38′. 21″. with Lat. North 1°. 8′. 13″. here the

the Difference of Longitude is 9′. 14″. of Lat. 5′. 57″. perhaps the position of the Zodiack was not rightly considered; but ♂ was certainly in antecedence and his Lat. to the North from ♃.

Anno Christi, 1170. *September* the 13th at midnight, two of the Planets were so conjoyned that it appeared as if they had been one and the same Star, but they were presently separated. *Gervasii Chronico.*

These two Planets were ♃ and ♂, being then so neer together that they seemed as one Star, but to some eyes a little distinguished.

The Sidereal Long. of the Sun was by our Tables 5ˢ. 5°. 26′. 31″. The mean Anomaly of ♃ 7ˢ. 23°. 51′. 50″. his Geocentrick Place 1ˢ. 19°. 16′. 3″. with Lat. South 42′. 44″. The mean Anomaly of ♂ 7ˢ. 27°. 13′. 49″. his Geocentrick Place 1ˢ. 19°. 8′. 55″. and Lat. South 39′. 1″. The Difference of Longitude is 7′. 8″. of Lat. 3′. 43″. and hence the Distance of their Centers 8′.

Anno 1461. *December* the 25th 5ʰ. 30′. reduced unto *London*, by the Observation of *Regiomontanus*, ♂ seemed conjunct in the same Longitude with the following brighter Star in the tail of ♑. The true place of ☉ was then 8ˢ. 17°. 32′. 34″. The mean Anomaly of ♂ 6ˢ. 9°. 39′. 42″. his Geocentrick Place 9ˢ. 20°. 17′. 39″. and his Lat. South 1°. 7′. 28″. but the place of the Star is 9ˢ. 20°. 23′. with Lat. South 2°. 30′.

1462. *Sept.* the 14th 15ʰ. in respect of the Mer. of *London*. *Regiomont.* Observed ♂ between the Lions heart and the Southern of the 3 Stars in his neck, as in a right line, and Distant to the North from *Cor* ♌ the quantity of the Diameter of ☉ ferè.

The true place of ☉ is 5ˢ. 4°. 51′. 9″. the mean Anomaly of ♂ 10ˢ. 27°. 41′. 26″. his Geocentrick place 3ˢ. 26°. 18′. 39″. and his Lat. North 1°. 17′. 11″. therefore ♂ was punctually in the said right Line, and his Distance from *Cor* ♌ 54′. which to the bare eye seems no more then 1. Diam. of ☉.

1462. *Octob.* the 15th 16ʰ. reduced. ♂ was in Antecedence from the hinder knee of ♌, and more Southerly, the Distance being by estimamation of *Regiomont*: equal to 4 Diameters of ♀. The true Long. of ☉ was 6ˢ. 5°. 40′. 38″. the mean Anomaly of ♂ 11ˢ. 13°. 57′. 27″. his Geocentrick Place 4ˢ. 15°. 14′. 7″. and his Lat. North 1°. 28′. 18″. but the place of the Star is 4ˢ. 15°. 31′. 30″. with Lat. North 1°. 40′.

The next following morning, he beheld ♂ in consequence from the Star, and Distant half as much more as the foregoing Morn. the Diurnal motion of ♂ at that time was 36′.

1479. *Novemb.* the 7th 15ʰ. reduced. *Bernard Walther* observed ♂ according to Longitude in ☌ with the following Star in the left wing of ♍, but more then a degree to the South. The true place of ☉ was 6ˢ. 28°.

 27′. 9″.

27′. 9″. the mean Anomaly of ♂ 0ˢ. 9°. 43′. 11″. his Geocentrick Place 5ˢ. 6°. 59′. 13″. and his Lat. North 1°. 23′. 46″. but the place of the Star is 5ˢ. 6°. 58′. 30″. with Lat. North 2°. 50′.

In the year before Christ, 272. *Octob.* the 11th 15ʰ. reduced unto *London. Timocharis* Observed ♀ applying neer to the former Star of the 4 in the left wing of ♍. *Ptol.*

The true Longitude of ☉ (à 1 ✶ ♈) was 6ˢ. 12°. 8′. 26″. The mean Anomaly of ♀ 5ˢ. 21°. 29′. 5″. her Geocentrick Place 5ˢ. 1°. 8′. 43″. with Lat. North 1°. 31′. 25″. but the place of the Star is 5ˢ. 1°. 39′. with Lat. North 1°. 25′.

Anno Christi, 132. *March* the 8th 5ʰ. reduced. ♀ was distant in antecedence about the whole length of the Pleiades from the middle or brightest of them, *Ptol.*

The true place of ☉ was 11ˢ. 9°. 22′. 33″. the mean Anomaly of ♀ 7ˢ. 0°. 10′. 20″. her Geocentrick Place 0ˢ. 24°. 3′. 37″. and her Lat. North 4°. 13′. 59″. the brightest of Pleiades 0ˢ. 26°. 47′. with Lat. North 4°. 1′.

Anno Christi, 138. *Decemb.* the 15th day, 14ʰ. 31′. was the Equal Time at *London*, when *Ptol.* at *Alexandria* Observed ♀ between and in a right line with the Northern brightest Star in the front of ♏ and the visible Center of the Moon. *Lib.* 10. *Cap.* 4.

The true Long. of ☉ from the Æpuinox was then by our Tables in ♐ 23°. 32′. 41″. The Moon in ♏ 5°. 56′. 53″. her Lat. North 5°. 8′. 40″. but according to Parallax, her Visible place at *Alexandria* was in ♏ 6°. 4[illegible] 40″. with Lat. North 4°. 52′. 42″. The mean Anomaly of ♀ 7ˢ. 2°. 52′ 22″. her Geocentrick Place in ♏ 7°. 23′. 18″. with Lat. North 3°. 3′. 17″ and the Place of the Star in ♏ 8°. 5′. 22″. with correct Lat. North 1°. 4[illegible] therefore the Visible Center of ☽, ♀ and the Star were truly in a right line. But that ♀ should be in antecedence from ☽, & their Visible Distance sesquialter to that of ♀ and the Star (as *Ptol.* there addeth) was plainly impossible.

Anno Christi, 140. *July* the 29th 14ʰ. reduced. ♀ was observed half a Moon to the East from the left knee of the following Twin. *Ptol.* The true Long. of ☉ was 3ˢ. 27°. 8′. 59″. the mean Anomaly of ♀ 2ˢ. 21° 17′. 56″. her Geocentrick place 2ˢ. 12°. 53′. 2″. with Lat. South 2° 7′. 39″. but the place of the Star is 2ˢ. 11°. 49′. with Lat. South 2°. 5[illegible]

In the 226. year of *Diocletian* (*Mesori* 26.) ♀ was seen in antecedence from ♃ at most 20 digits, but the 28th in consequence 10 digits, but in Lat. there appeared no difference. See *Astron. Philolaica*, *Lib.* 9. *Pag.* 346. & *seq.*

This was *Anno Christi*, 510. The first Observation *August* the 19th presently after Sun set, and the time by estimation at *London* 5ʰ. 40′.

The

The true place of ☉ by our Tables $4^{s}.\ 14^{\circ}.\ 32'.\ 42''$. the mean Anomaly of ♃ $0^{s}.\ 1^{\circ}.\ 2'.\ 22''$. his Geocentrick Place $5^{s}.\ 6^{\circ}.\ 46'.\ 18''$. and his Lat. North $1^{\circ}.\ 8'.\ 23''$. the mean Anomaly of ♀ $8^{s}.\ 29^{\circ}.\ 20'.\ 19''$. her Geocentriek Place $5^{s}.\ 5^{\circ}.\ 25'.\ 45''$. and her Lat. North $1^{\circ}.\ 0'.35''$. the Difference of the Long. of ♃ & ♀ $1^{\circ}.\ 20'.\ 33''$. of Lat. $7'.\ 48''$.

The second Obs. *August* the 21th $5^{h}.\ 40'$. the true place of ☉ $4^{s}.\ 16^{\circ}.\ 29'.\ 9''$. The mean Anomaly of ♃ $0^{s}.\ 1^{\circ}.\ 12'.\ 20''$. his Geocentrick Place $5^{s}.\ 7^{\circ}.\ 11'.\ 18''$. and his Lat. North $1^{\circ}.\ 8'.\ 16''$. the mean Anomaly of ♀ $9^{s}.2^{\circ}.32'.34''$. her Geocentrick Place $5^{s}.7^{\circ}.53'.27''$. and her Lat. North $56'.47''$. the Difference of Longitude $42'.9''$. of Lat. $11'.29''$.

In both which Observations, the contraction of the Eye being duly considered, the Observed and Computed Distances do excellently agree, the difference of Lat. in those intervals not easily appearing.

And though the Month, with the day of the first Observation, be omitted in the Original Greek Copy, it could be no other then *Mesori* 26. not 27. as *Bull.* imagineth.

In the 21th year of *Dionysius*, the 22th day of Scorpio, in the Morning, ☿ was seen Distant one Moon backward (or in antecedence) from a right line passing through the Northern and middle Stars of the front of ♏, but to the North from the Northern, two Moons; and 4 dayes after, on the 26th of Scorpio, he was Distant from the same line in consequence one whole Moon and a half, *Ptol. Lib. 9. Cap.* 10.

This was in the year before Christ 265. and in all probability on the 17th and 21th dayes of *November*; not as *Ptol.* seems to account by middle Motions, &c. as you may see in *Cunitia, De usu Tabularum, Pag.* 105. Observe our following Calculation.

Anno ante Christum, 265. *November* the 16th day, $15^{h}.\ 30'$. reduced unto *London*. The true Longitude of ☉ (a 1 ✱ ♈) was $7^{s}.\ 18^{\circ}.\ 49'.\ 53''$. from the Æquinox in ♏ $21^{\circ}.\ 34'.\ 35''$. The mean Anomaly of ☿ $7^{s}.\ 12^{\circ}.\ 37'.\ 17''$. his Geocentrick sidereal Place $6^{s}.\ 29^{\circ}.27'.\ 32''$. with Lat. North $2^{\circ}.44'.\ 19''$.

Novemb. the 20th $15^{h}.\ 30''$. The true Long. of ☉ $7^{s}.\ 22^{\circ}.54'26''$. from the Æquinox in ♏ $25^{\circ}.\ 39'.\ 9''$. The mean Anomaly of ☿ $7^{s}.28^{\circ}.\ 59'.\ 27''$. and his Geocentrick Place $7^{s}.\ 1^{\circ}.\ 37'.4''$.

Therefore in the first Observation, ☿ was in antecedence from the said right line $52'$. in Lat. to the North from the Northern brightest of the Scorpions front $1^{\circ}.\ 40'$. and in the second Observation he was half as much more from the same line in consequence as in the first in antecedence; agreeing in all respects with the appearance.

Anno Christi, 1481. *October* the 21th $17^{h}.\ 30'$. reduced to our Meridian. *Bernard Walther* saw ☿ distant in Longitude to the East from ♄, as he judged by

by the eye not above the Diameter of the Moon, and both in the same Latitude.

The true Longitude of ☉ was then $6^{s}. 11^{\circ}. 53'. 56''$. The mean Anomaly of ♄ $9^{s}. 15^{\circ}. 38'. 12''$. his Geocentrick place $5^{s}. 22^{\circ}. 17'. 55''$. his Lat. North $2^{\circ}. 16'. 49''$. The mean Anomaly of ♀ $7^{s}. 0^{\circ}. 39'. 48''$. his Geocentrick Place $5^{s}. 23^{\circ}. 2'. 47''$. and his Lat. North $2^{\circ}. 12'. 8''$. therefore their distance was $45'$. &c. agreeing best with Observation.

Anno 1488. *January* the 17th $4^{h}. 50'$. reduced by the Instrumental Observation of *Bernard Walther*, the Distance between ♄ and ☿ was $1^{\circ}. 44'. \frac{1}{2}$. The true Long. of ☉ was then $9^{s}. 10^{\circ}. 15'. 52''$. The mean Anomaly of ♃ $4^{s}. 25^{\circ}. 6'. 20''$. his Geocentrick Place $9^{s}. 28^{\circ}. 8'. 35''$. and his Lat. South $54'. 20''$. The mean Anomaly of ☿ $5^{s}. 24^{\circ}. 55'. 59''$. his Geocentrick place $9^{s}. 28^{\circ}. 17'. 52''$. and Lat. North $49'. 4''$. therefore the Distance of their Centers $1^{\circ}. 44'$.

Again, *January* the 19th $4^{h}. 50'$. reduced; he Observed the Distance between ♃ and ☿ $2^{\circ}. 23'$ ferè. ☿ more Easterly and Northerly then ♃. The true Long. of ☉ was $9^{s}. 12^{\circ}. 17'. 41''$. The mean Anomaly of ♃ $4^{s}. 25^{\circ}. 16'. 19''$. his Geocentrick Place $9^{s}. 28^{\circ}. 36'. 56''$. and his Lat. South $54'. 21''$. The mean Anomaly of ☿ $6^{s}. 3^{\circ}. 7'. 4''$. his Geocentrick place $9^{s}. 29^{\circ}. 25'. 2''$. with Lat. North $1^{\circ}. 22'. 2''$. and hence their true Distance $2^{\circ}. 24'. \frac{1}{2}$.

1504. *March* the 17th $6^{h}. 19'$. reduced, &c. *Bernard Walther* at *Norimberg*, Observed the Sidereal Longitude of ☿ compared with *Aldebaran*, $11^{s}. 29^{\circ}. 20'. \frac{1}{2}$. whence his true place correct by refraction was $11^{s}. 29^{\circ}. 14'$. The true Long. of ☉ was then by our Tables $11^{s}. 10^{\circ}. 18'. 57''$. The mean Anomaly of ☿ $7^{s}. 6^{\circ}. 19'. 33''$. and his Geocentrick place $11^{s}. 29^{\circ}. 15'. 35''$. ☿ being in or neer his greatest Elongation from ☉.

The next following day, *March* the 18th. $6^{h}. 24'$ reduced &c. by the Observation of *Walther*, correct as before, The true place of ☿ was $0^{s}. 0^{\circ}. 14'$.

The true Long. of ☉ by our Calculation $11^{s}. 11^{\circ}. 18'. 13''$. The mean Anomaly of ☿ $7^{s}. 10^{\circ}. 25'. 57''$. and his Geocentrick place $0^{s}. 0^{\circ}. 14'. 22''$.

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The Equal Times at *London* with the Planets Places Computed by our Tables to the Obſervations of *Tycho Longomontanus Bullialdus Gaſſendus* and others follow.

♄ In ☍ to ☉ Obſerved by *Tycho* and *Longomont*.

Anno	Menſ. D. H. ′	Loc. ☉ verus s. °. ′. ″	Anom. ♄ med. s. °. ′. ″	Loc. ♄ Comput. s. °. ′. ″	Loc. ♄ Obſer. s. °. ′. ″	Differ. ′. ″
1582.	Aug 21. 1.24	4.10. 9.46	2.17.53.39	10.10. 1.45	10.10. 5.36	+3.51
1583.	Sept. 3. 0.21	4.22.31.29	3. 0.32.52	10.22.26.22	10.22.28.44	+2.22
1584.	Sept. 15. 5.47	5. 5.14.30	3.13.11.43	11. 5.10.31	11. 5.11.51	+1.20
1585.	Sept. 28.18.43	5.18.22. 0	3.25.51.41	11.18.14.55	11.18.13.28	−1.27
1586.	Oct. 12.10. 9	6. 1.41.53	4. 8.31.49	0. 1.39.30	0. 1.38. 5	−1.25
1587.	Oct. 26. 8. 6	6.15.24. 7	4.21.12.32	0.15 22. 0	0.15.21.12	−0.48
1588.	Nov. 8 9.16	6.29.19.51	5. 3.53.29	0.29.19.39	0.29.18.19	−1.20
1589.	Nov. 22.13.37	7.13.28. 2	5.16.34.43	1.13.27.59	1.13.26.26.	−1.33
1590.	Dec. 6.19.40	7.27.43.35	5.29.16. 6	1.27.41.43	1.27.42.33	+0.50
1591.	Dec. 21. 0.13	8.11.56.37	6.11.57.22	2.11.55.40	2.11.56.10	+0.30
1595.	Jan. 30.20.14	9.23.41.43	7.19.59.37	3.23.44.51	3.23.44.32	−0.19
1608.	Jul. 9. 2.21	2.29.12.25	1. 4.13.18	8.29.13.49	8.29 10.37	−3.12
1609.	Jul. 21.12.24	3.10.49.56	1.16.50.59	9.10.45.30	9.10.47.43	+2.13
1610.	Aug. 2.21.55	3.22.28 52	1.29.28.38	9.22.29 51	9.22.25.51	−4. 0
1611.	Aug. 15.15.25	4. 4 30.34	2.12. 6.57	10. 4.28 16	10. 4.26.58	−1.18

♄ By Applications to fixt Stars, *Bullialdus*.

Anno Menſ. D. H. ′	Loc. ☉ verus s. °. ′. ″	Anom ♄ med. s. °. ′. ″	Loc. ♄ Comput. s. °. ′. ″	Loc. ♄ Obſer. s. °. ′. ″	Differ. ′. ″
1639. Sept. 6. 8. 0	4.25.26.45	1.25. 1.55	9.14.31.20	9.14.27. 7	−4.13
1639. Nov. 4. 7. 0	6.24. 7 30	1.27. 0.17	9.14.30.44	9.14.27.58	−2.46
1640. Oct. 2. 8. 0	5.21.49 17	2. 8. 8.53	9.25.50.15	9.25.45 52	−4.23
1641. Aug. 19.10. 0	4. 8 28.34	2.18.53.29	10.11.18.19	10.11.23. 8	+4 49

♃ In ☍ to ☉ Obſerved by *Tycho* and *Longomont*.

Anno Menſ. D. H. ′	Loc. ☉ verus s. °. ′. ″	Anom. ♃ med s. °. ′. ″	Loc. ♃ Comp. s. °. ′. ″	Loc. ♃ Obſer. s. °. ′. ″	Differ. ′. ″
1583. Sept. 6.19 30	4.26.14.18	5.17.39.54	10.26.14.38	10.26. 11 .43	−2 55
1584. Oct. 13. 6.29	6. 3. 3.27	6 21. 6.23	0. 3. 2.56	0. 2.59.47	−3. 9
1591. Apr. 23.17.54	0.15 37.13	1. 9. 9.20	6.15 40.44	6.15.42 14	+1.30
1595. Sept. 12. 5.28	5. 1.28.41	5.22.18.36	11. 1.19.30	11. 1.24.30	+5. 0
1596. Oct. 18.11. 8	6. 8.11.23	6.25.43.59	0. 8. 5. 6	0. 8. 7 34	+2 28
1607. Sept. 17.10.27	5 6.31.48	5.26.56 16	11. 6.26.20	11 6.28.18	+1.58
1610. Dec. 30.13.55	8.21.50.51	9. 6.39.40	2.21 56.58	2.21.51.30	−5.28
1613. Mar. 1.11. 5	10.23.47.28	11.12.27.38	4.23 52.44	4.23 58.39	+5 55

Long.

Longomont. hath the time of this last ☍ at *Uraniburg* 22^h. which probably was a mistake, and should be rather 12^h. or otherwise by his own calculation, &c. the Sun was too far from the ☍ of ♃.

One *Hassiack* Observation a day after the ☍.

Anno	Mens.	D.	H. ′.	Loc. ☉ verus. s. °. ′. ″.	Anom. ♃ med. s. °. ′. ″.	Loc. ♃ Comp. s. °. ′. ″.	Loc. ♃ Obser. s. °. ′. ″.	Differ. ′. ″.
1594.	Aug.	6.	8. 38.	3. 25. 53. 21.	4. 18. 55. 5.	9. 24. 42. 30.	9. 24. 43. 56.	+ 1. 26.

Applications of ♃ to fixt Stars.

1623. *October* the 12th, 17^h. *Bullialdus* Observed ♃ in more Longitude then *Cor* ♌. 3′. and Latitude to the North 8′.

The true Place of ☉ was then 5^s. 21°. 32′. 52″. The Mean Anomaly of ♃. 10^s. 3°. 48′. 0″. his Geocentrick place, 3^s. 26°. 48′. 22″. and his Latitude North 47′. 0″. Therefore the difference of Longitude was 8′. $\frac{1}{3}$. and of Latitude 20′. ferè, agreeing well with the Observation made only by estimation of the bare eye; and this compared with the ☌ of ♃ & *Cor* ♌ Observed *A. C.* 508. *Sept.* 27. manè, shews the immobility of the Nodes.

1633. *Decemb.* the 8th 16^h. *Gassendus* observed ♃ distant 4. $\frac{1}{2}$. of his own Diameters from *Propus*, ♃ more Southerly and near ☌ with the Star.

The true Long. of ☉ was 7^s. 29°. 36′. 25″. The Mean Anomaly of ♃ 8^s. 12°. 54′. 5″. his Geocentrick place, 1^s. 27°. 44′. 31″. and Lat. South 17′. 3″. but the place of the Star is 1^s. 27°. 45′. with correct Lat. South, 11′. $\frac{1}{2}$.

1634. *April* the 2d. 8^h. by the Telescope-observation of *Bulliadus*, ♃ was at least 3′. in consequence from *Propus*. at which time the true place of ☉ was 11^s. 24°. 49′. 51″. the mean Anom. of ♃ 8^s. 22°. 25′. 46″. and his Geocentrick place 1^s. 27°. 49′. 22″.

1634. *November* the 24th, 10^h. *Bull.* Observed ♃ exactly in the same Longitude with the South *Asellus*. The true place of ☉ was 7^s. 14°. 49′. 29″. the Mean Anom. of ♃. 9^s. 12°. 2′. 47″. and his Geocentrick Longitude 3^s. 5°. 31′. 4″. as observed.

1637. *March* the 14th, 11^h. 30′. *Bull.* observed ♃ conjunct according to Longitude with the former Star of the 4 in the left wing of ♍.

The true place of ☉ was 11^s. 6°. 32′. 59″. the Mean Anom. of ♃ 11^s. 21°. 55′. 56″. and his Geocentrick place, 5^s. 1°. 35′. 8″. but the place of the Star is, according to *Tycho*, 5^s. 1°. 39′.

1639. *August* the 21th, 8^h. *Bull.* observed ♃ about 2′ in consequence from the Northern brightest of the front of ♏.

The

The true place of the Sun computed 4^s. 9°. 51′. 39″. the Mean Anom. of ♃ 2^s. 5°. 52′. 21″. and his Geocentrick place 7^s. 0°. 1′. 30″. but the place of the Star is 6^s. 29°. 59′.

1649. *May* the first day, 10^h. ♃ was observed just 1′ in antecedence from the former of the 4 in the left or Southern wing of ♍.

The true place of ☉ was then 0^s. 23°. 9′. 54″. the Mean Anomaly of ♃ 0^s. 0°. 6′. 38″. and his Geocentrick place, 5^s. 1°. 34′. 9″.

The following 31th, or last of *May*, at Noon, The Longitude of ♃ was by Observation made the night before and after, exactly the same with the Star.

The true place of ☉ was 1^s. 21°. 29′. 5″. the Mean Anom. of ♃ 0^s. 2°. 34′. 7″. and his Geocentrick place, 5^s. 1°. 35′. 18″.

And the Motion of ♃ in these two last Observations, with that of 1637, *March* the 14th, so precisely agreeing, shews the difference, though it be but small, rather in the place of the Star then ♃.

♂ In ☍ to ☉. by *Tycho*, *Kepler*, *Fabricius* and *Longomont*.

Anno Mens. D. H. ′	Loc. ☉ verus s ° ′ ″	Ano. ♂ med. s ° ′ ″	Loc. ♂ Comp. s ° ′ ″	Loc. ♂ Obser. s ° ′ ″	Diffr. ′ ″
1580. Nov. 18. 0. 37	7. 9. 9. 30	8. 27. 20. 0	1. 9. 6. 53	1. 9. 8. 41	+1. 48
1582. Dec. 28. 3. 12	8. 19. 31. 17	10. 10. 53. 48	2. 19. 31. 32	2. 19. 33. 48	+2. 16
1585. Jan. 30. 18. 28	9 24. 11. 8	11. 24. 35 33	3. 24. 11. 10	3. 24. 12. 42	+1. 32
1587. Mar. 6. 6. 27	10. 28. 13. 20	1. 2. 12. 59	4. 28. 23. 10	4. 28. 17. 45	−5. 25
1589. Apr. 14. 5. 17	0. 6. 53. 56	2. 15. 41. 51	6. 7. 0. 49	6. 6. 55. 58	−4. 51
1591. Jun. 8. 6. 51	1. 29. 13. 53	4. 7 5. 57	7. 29. 10. 18	7. 29. 14. 8	+3. 50
1593. Aug 25. 16. 50	4. 14. 51. 8	6. 11. 15. 40	10. 14. 41. 9	10. 14. 45. 15	+4. 6
1595. Oct. 30. 23. 45	6. 20. 4. 1	8. 8. 32. 38	0. 19. 55. 27	0. 19. 59. 3	+3. 36
1597. Dec. 13. 15. 5	8. 4. 53. 11	9 24. 28. 53	2. 4. 48. 15	2. 4. 53. 35	+5. 20
1600. Jan. 18. 13. 18	9. 10. 58. 1	11. 5. 51. 11	3. 10 58. 23	3. 11. 1. 48	+3. 25
1602. Feb. 20. 13. 21	10 14. 43. 33	0. 16. 13. 0	4. 14. 49. 22	4 14. 49. 2	−0. 20
1604. Mar. 28. 15. 19	11. 20. 54. 11	1. 28. 11. 39	5. 20. 58. 22	5. 20. 57. 25	−0 57
1608. Jul. 24. 1. 25	3. 13. 30. 46	5. 15. 20. 30	9 13. 32. 19	9. 13. 27. 34	−4. 45
1610. Oct. 8. 16. 0	5 27. 48. 22	7. 18. 1. 54	11. 27. 41. 2	11. 27. 45. 42	+4. 40

♂ Extra situm *Acronychium. Tytho.*

Anno Menſ. D. H.	Loc. ☉ verus	Anom. ♂ med.	Loc. ♂ Comput.	Loc. ♂ Obſer.	Differ.
	s. o. ′. ″	s. o. ′. ″	s. o. ′. ″	s. o. ′. ″	′. ″
1582. Nov. 23. 15. 7	7. 14. 20. 12	9. 22. 48. 56	2. 29. 17. 45	2. 29. 16. 53	— 0 52
Dec. 26. 7. 44	8. 17. 40. 26	10. 9. 56. 51	2. 20. 15. 18	2. 20. 18. 49	+ 3. 31
Dec. 30. 7 25	8. 21. 44. 23	10. 12. 2. 12	2. 18. 39. 24	2. 18. 38. 48	— 0. 36
1583. Ian. 26. 5. 50	9. 19. 6. 5	10. 26. 8. 37	2. 10 57. 4	2. 10. 58. 45	+ 1. 41
1584. Dec. 21. 13. 13	8. 13. 18. 14	11. 0. 30. 59	4. 3. 51. 36	4. 3. 50. 7	— 1. 29
1585. Ian. 24. 8. 15	9. 17. 41. 14	11. 18. 13. 31	3. 26. 43. 1	3. 26. 44. 3	+ 1. 2
Feb. 4. 5. 53	9. 28. 42. 6	11. 23. 56. 15	3. 22 24. 31	3. 22. 23. 31	— 1. 0
Mar. 12. 9. 31	11. 4. 47. 45	0. 12. 52. 56	3. 14. 21. 14	3. 14. 22. 26	+ 1 12
1587. Jan. 25. 16. 15	9. 18. 31. 7	0. 11. 28. 9	5. 7. 19. 46	5. 7. 16. 50	— 2. 56
Mar. 4. 12. 28	10. 26. 29. 9	1. 1. 17. 59	4. 29. 4. 1	4. 29. 0. 25	— 3. 36
Mar. 10. 10. 32	11. 2. 21. 15	1. 4. 24. 6	4. 26. 45. 30	4. 26. 40. 0	— 5. 30
Apr. 21. 8. 24	0. 13. 19. 44	1. 26. 21 52	4. 18. 25. 12	4. 18. 22. 59	— 2. 13
1589. Mar. 8. 15. 27	11. 1. 3. 38	1. 26. 31. 49	6. 14. 53. 11	6. 14. 49. 53	— 3. 18
Apr. 13. 10. 9	0. 6. 7. 32	2. 15. 16. 48	6. 7. 18. 21	6. 7. 16. 18	— 2. 3
Apr. 15. 10. 59	0 8. 5. 53	2. 16. 20. 46	6. 6. 33. 26	6. 6. 31. 17	— 2. 9
Maij. 6. 10. 15	0. 28. 19. 15	2. 27. 20. 6	5. 29. 41. 58	5. 29. 40. 14	— 1 44
1591. Maij. 13. 12. 57	1. 4. 39. 1	3. 23. 36. 27	8. 4. 46. 13	8. 4. 51. 11	+ 4. 58
Jun. 6. 11. 27	1. 27. 30. 30	4. 6. 9. 5	7. 29. 43. 24	7. 29. 46. 8	+ 2. 44
Iun. 10. 10. 59	2. 1. 18. 0	4. 8. 14. 14	7. 28. 30. 18	7. 28. 33. 44	+ 3. 26
Jun. 28. 9. 41	2. 18. 23. 27	4. 17. 38. 30	7. 23. 40. 29	7. 23. 41. 5	+ 0. 36
1593. Jul. 21. 13. 24	3. 10. 57 46	5. 22. 50. 41	10. 20. 11. 3	10. 20. 15. 4	+ 4. 1
Aug. 22. 11. 44	4. 11. 43. 50	6. 9. 34. 40	10. 15. 34. 38	10. 15. 39. 30	+ 4. 52
Aug. 29. 9. 42	4. 18. 27. 25	6. 13. 12. 4	10. 13. 40. 20	10 13. 43. 14	+ 2. 54
Oct. 3. 7. 11	5. 22. 48. 33	7. 1. 29. 15	10. 10. 15. 41	10. 10. 19. 20	+ 3. 39
1595. Sept. 17. 16. 1	5. 6. 49. 41	7. 15. 50. 30	0. 28. 31. 35	0. 28 34. 42	+ 3. 7
Oct. 27. 11. 26	6. 16. 30. 4	8. 6. 42. 10	0. 21. 15. 41	0. 21. 18. 38	+ 2. 57
Nov. 3. 11. 6	6. 23. 32. 59	3. 10. 21. 51	0. 18. 43. 32	0. 18. 45. 53	+ 2. 21
Dec. 18. 7. 12	8. 9. 9. 20	9. 3. 51. 36	0. 14. 7. 21	0. 14. 7. 17	— 0. 4

1591. *January* the 9th in the morning, *Michael Mæſtlin* obſerved eclipſed by ♂. *January* 8d. 17h. The true place of ☉ was 9s. 1°. 16′. 1 The Mean Anomaly of ♃ 1s. 0°. 25′. 40″. his Geocentrick place, 6 17°. 38′. 39″. with Lat. North, 1°. 7′. 8″. The Mean Anomaly of 1s. 18°. 11′. 29″. his Geocentrick place, 6s. 17°. 37′. 37″. and h Lat. North, 1°. 8′. 38″. The difference of Long. is 1′. 2″. of Lat. 1′. 30 and hence the diſtance of their Centers, 1′. 49″. ſo that the firy red ligh of ♂ eclipſed ♃, as was obſerved.

1644. *July* 27d. 14h. Mr. *Wing* at *N. Luffenham*; and my ſelf at th time in South-Wales, with due conſideration had to the contraction of th eye, &c. obſerved ♂ in antecedence from ♃ about 5′. and more ſouther 10′. The true place of ☉ was 3s. 16°. 41′. 19″. The mean Anomal of ♃ 7s. 5°. 37′. 34″. his Geocent. place, 1s. 0°. 12′. 34″. with La South, 58′. 53″. The mean Anom. of ♂ 7s. 7°. 43′. 13″. his Geocen place, 1s. 0°. 7′. 31″. and Latitude South, 1°. 9′. 9″. Therefore th differenc

difference of Long. was $5'. 3''$. and of Lat. $10'. 16''$. according to Observation.

1644. *Sept.* the 16th 12^h. *Bullialdus* by an Optick tube observed ♂ in consequence from *Propus*, and distant 4 or $5'$ in the same *Almicanthar*.

The true place of ☉ was $5^s. 6^\circ. 7'. 56''$. The Mean Anom. of ♂ $8^s. 4^\circ. 24'. 9''$. his Geocent. place, $1^s. 27^\circ. 49'. 44''$. and Lat. South $10'. 42''$. but the place of the Star is $1^s. 27^\circ. 45'$. with correct Lat. South $11'.\frac{1}{2}$.

1644. *Nov.* the 10th 18^h. Mr. *Wing* with a Perspective Observed ♂ to the West and South from the Northern knee of ♊. the difference of Long. being about 2, and of Lat. 4 Diameters of ♂.

The true place of ☉ was $7^s. 1^\circ. 23'. 27''$. The Mean Anomaly of ♂. $9^s. 3^\circ. 21'. 20''$. his Geocent. place $2^s. 6^\circ. 39'. 17''$. and Lat. North, $1^\circ. 59'. 37''$. but the place of the Star is $2^s. 6^\circ. 45'$. with correct Lat. North $2^\circ. 12'.\frac{1}{2}$.

Nov. 26 day, 19^h. he observed ♂ almost full North from the heel of the higher foot of ♊. distant by Instrument $3^\circ. 36'$. and in antecedence from the Star about 3 times his Diameter.

The true place of ☉ was $7^s. 17^\circ. 41'. 27''$. The Mean Anomaly of ♂ $9^s. 11^\circ. 45'. 42''$. his Geocent. place, $2^s. 0^\circ. 9'. 44''$. and Lat. North $2^\circ. 44'. 58''$. but the place of the Star is $2^s. 2^\circ. 7'$. with correct Lat. South, $51'.\frac{1}{2}$.

1655. *Octob.* the 18th day, 9^h. I observed ♂ with a Perspective in or near the same Long. with the first of the two bright Stars in the tail of ♑. but in lesse South Lat. abont $6'$.

The true place of ☉ was $6^s. 6^\circ. 59'. 58''$. The Mean Anom. of ♂ $6^s. 26^\circ. 9'. 11''$. his Geocent. place $9^s. 18^\circ. 38'. 45''$. and his Lat. South, $2^\circ. 20'. 55''$. but the place of the Star is according to *Tycho*, $9^s. 18^\circ. 37'$. with South Lat. correct $2^\circ. 27'$.

1658. *April* the 25th. 9^h. my self together with an ingenious friend saw ♂ in less North Lat. and a little in antecedence from the Northern knee of ♊. and as neer as we could gather, the Difference of Long. was to the Difference of Lat. as 1 to 8.

The true place of ☉. was $0^s. 17^\circ. 3'. 9''$. The Mean Anom. of ♂ $10^s. 28^\circ. 15'. 54''$. his Geocentrick place $2^s. 6^\circ. 39'. 11''$. his Lat. North $1^\circ. 24'. 33''$. and the place of the Star is $2^s. 6^\circ. 45'$. with Lat. North $2^\circ. 12'.\frac{1}{2}$.

Observations of ♀.

1574. *Sept.* $15^d. 15^h. 30'$. *Michael Mæstlin* saw ♀ cover the Lyons heart. The true place of ☉ was $5^s. 5^\circ. 12'. 23''$. the Mean Anomaly of ♀. $4^s. 22^\circ.$

$4^{s}.22^{\circ}.20'.3''$. her Geocentrick place $3^{s}.26^{\circ}.44'.34''$. and her Lat. North $25'.42''$. but the place of *Cor* ♌ is $3^{s}.26^{\circ}.40'$. with Lat. North $27'.\frac{1}{3}$. and therefore the light of ♀ covered him from the sight of the Observator.

1587. *Janu.* $15^{d}.3^{h}.55'$. *Tycho* Observed the sidereal Longitude of ♀ $10^{s}.19^{\circ}.30'$.

The true place of ☉ was $9^{s}.7^{\circ}.51'.20''$. the Mean Anom. of ♀ $5^{s}.9^{\circ}.9'.11''$. and her Geocentrick place $10^{s}.19^{\circ}.30'.25''$.

1590. *Octob.* $2^{d}.16^{h}.24'$. *Michael Mœstlin* Observed ♂ Eclipsed by ♀.

The true Longitude of ☉ was $5^{s}.21^{\circ}.57'.54''$. The Mean Anomaly of ♂ $11^{s}.26^{\circ}.49'.22''$. his Geocent. place $4^{s}.18^{\circ}.3'.27''$. and Lat. North $1^{\circ}.16'.47''$. The mean Anom. of ♀ $5^{s}.22^{\circ}.28'.25''$. her Geocent. place $4^{s}.18^{\circ}.2'.46''$. with Lat. North $1^{\circ}.16'.39''$. The Difference of Long. is $41''$. and of Lat. $8''$. therefore ♀ wholly Eclipsed ♂, as by Observation.

1598. *Sept.* $14^{d}.13^{h}.40'$. *John Kepler* Observed that ♀ covered *Cor* ♌, but soon after the Star appeared, &c.

The true place of ☉ was $5^{s}.4^{\circ}.0'.29''$. the Mean Anom. of ♀ $4^{s}.24^{\circ}.52'.28''$. her Geocent. place $3^{s}.26^{\circ}.46'.16'$. and Lat. North $30'.14''$.

1601. *April* $29^{d}.7^{h}.24'$. by the Observation of *Tycho*, the Sidereal place of ♀ was $2^{s}.6^{\circ}.43'.\frac{1}{2}$.

The true Long. of ☉ was $0^{s}.21^{\circ}.24'.31''$. the Mean Anom. of ♀ $7^{s}.29^{\circ}.17'.45''$. and her Geocentrick place computed $2^{s}.6^{\circ}.43'.27''$.

1633. *May* $16^{d}.8^{h}.38'$. *Bull.* with an Optick tube Observed ♀ Distant from the Star in the left shoulder of the following Twin $18'$. or at most $19'$. ♀ a little more Westerly and Southerly then the Star.

The true place of ☉ was $1^{s}.7^{\circ}.35'.32''$. the Mean Anom. of ♀ $9^{s}.2^{\circ}.18'.5''$. her Geocent. place $2^{s}.20^{\circ}.17'.33''$. and her Lat. North $2^{\circ}.49'.54''$. but the place of the Star is $2^{s}.20^{\circ}.29'$. with correct Lat. North $3^{\circ}.4'.\frac{1}{2}$. the Difference of Long. $11'.27''$. of Lat. $14'.36''$. and the Distance as observed.

To these I shall adde 7 Distances of ♀ from the Sun, the first 6 being accurately Observed by *Tycho* and the 7th by *Gassendus*; Corrected by Refraction and Parallax where need requires.

1582. *Febr.* $26^{d}.2^{h}.41'$. The true place of the Sun was by our Calculation $10^{s}.20^{\circ}.23'.21''$. The Mean Anom. of ♀ $6^{s}.0^{\circ}.52'.20''$. her Geocentrick place $0^{s}.6^{\circ}.33'.32''$. with Lat. North $2^{\circ}.42'.6''$. and hence the true Distance of their Centers $46^{\circ}.13'.51''$. Observed $46^{\circ}.13'$.

1582. *March* $20^{d}.1^{h}.24'$. The true place of ☉ was $11^{s}.12^{\circ}.7'.17''$. the Mean Anom. of ♀ $7^{s}.6^{\circ}.1'.59''$. her Geocentrick place $0^{s}.25^{\circ}$.

$47'.14''$.

47′. 14″. with Lat. North 4°. 27′. 56″. therefore the Distance of their Centers 43°. 50′. 52″. Observed 43°. 50′.

1582. *April.* 3d. 0h. 35′. The true place of ☉ was 11s. 25°. 48′. 18″. the Mean Anom. of ♀ 7s. 28°. 24′. 31″. her Geocent. place 1s. 4°. 6′. 50″. with Lat. North 5°. 23′. 38″. the Distance of their Centers 38°. 37′. 44″. Observed 38°. 38′. ¾.

1587. *Janu.* 23d. 23h. 30′. The true place of ☉ 9s. 16°. 47′. 57″. the Mean Anom. of ♀ 5s. 23°. 16′. 38″. her Geocent. place 10s. 23°. 39′. 4″. with Lat. North 4°. 19′. 48″. Distance of their Centers 37°. 4′. 10″. Observed 37°. 6′.

1588. *Octob.* 25d. 22h. 54′. The true place of ☉ 6s. 15°. 45′. 55″. the mean Anom. of ♀ 4s. 0°. 12′. 8″. her Geocent. place 5s. 8°. 42′. 58″. with Lat. South 1°. 11′. 28″. Distance of their Centers 37°. 3′. 56″. Observed 37°. 2′. ¼.

1600. *Febr.* 11d. 19h. 38′. The true place of ☉ 10s. 5°. 28′. 43″. the mean Anom. of ♀ 8s. 10°. 22′. 10″. her Geocent. place 8s. 18°. 51′. 8″. with Lat. North 3°. 15′. 3″. Distance of their Centers computed 46°. 42′. 48″. Observed 46°. 43′. ferè.

1633. *Decemb.* 23d. 21h. 8′. The true place of ☉ 8s. 15°. 7′. 53″. the mean Anom. of ♀ 8s. 27°. 12′. 22″. her Geocent. place 7s. 15°. 26′. 12″. and Lat. North 1°. 11′. 24″. Distance of their Centers 29°. 42′. 59″. Observed 29° 42′. ¼.

Observations of ☿.

1601. *April* 19d. 7h. 24′. *Tycho* at *Prague* observed ☿ in Altitude about 7°. Distant from *Capella* 25°. 40′. and from *Procyon* 53°. 14′. whence his true place correct by Refraction, &c. was 1s. 2°. 8′. with Lat. North 2°. 37′. The Sidereal Long. of ☉ by our Tables was 0s. 11°. 45′. 30″. the mean Anomaly of ☿ 8s. 18°. 51′. 35″. his Geocentrick place 1s. 2°. 8′. 0″. and Lat. North 2°. 34′. 23″.

1607. *April* the 14th. 7h. 24′. *Longomont.* at *Hafnia*, half an hour past 8, Observed the Distance of ♀ and ☿ 2°. 24′. and the difference of Longitude and Latitude almost equal.

The true place of ☉ was 0s. 6°. 23′. 47″. the Geocentrick Long. of ♀ 0s. 20°. 16′. 5″. and her Lat. South 8′. 21″. The Mean Anom. of ☿ 6s. 24°. 42′. 7″. his Geocentrick place 0s. 22°. 2′. 2″. with Lat. North 1°. 45′. 40″. The Difference of Long. is 1°. 46′. of Lat. 1°. 54′. and hence their true Distance 2°. 35′. ½. from which (supposing the Altitude of ♀ 1°.) the Refraction substracts 9 or 10′. leaving the Visible Distance of their Centers 2°. 26′.

1632. *July* 20d. 15h. 12′. By the Telescope-Observation of *Gassendus*

at

at *Paris*, ♀ and ☿ were in respect of Longitude exactly in ☌. the Lat. o ☿ being more Northerly by about 5 Diameters of ♀, which to the ba eye seemed but as one Diameter. The same Observed *Hortensius* at *Am-sterdam*.

The true place of ☉ was 3s. 10°. 5'. 46''. The Mean Anom. of ♀ 5 2°. 6'. 3''. her Geocent. place 2s. 26°. 19'. 24''. and Lat. North 32 14''. The Mean Anom. of ☿ 5s. 24°. 10'. 57''. his Geocent. place 2s. 26 19'. 42''. with Lat. North 35'. 21''. The Difference of Long. is 18 and of Lat. 3'. 7''. ☿ more Northerly then ♀, as Observed.

7 Other Observations of *Gassendus*.

Anno Mens. D. H.	Loc. ☉ verus s. °. '. ''	Anom. ☿ med. s. °. '. ''	Loc. ☿ Comp. s. °. '. ''	Loc. ☿ Obser. s. °. '. ''	Differ. '. ''
1634. Sept. 22. 17. 15	5 11. 49. 54	6. 3. 50. 42	4. 23. 59. 1	4. 24. 1.	+ 2
Sep. 23. 17. 15	5. 12. 49. 13	6. 7 56. 14	4. 24. 53. 43	4. 24 53. 3/4	0
1635. Ian. 6. 17. 10	8. 28. 58. 26	8. 17. 37. 5	8. 6. 21. 9	8. 6. 21.	9
Jan. 14. 17. 48	9. 7. 8. 20	9. 20. 27. 54	8. 12. 3. 7	8. 11. 59.	− 4
Nov. 21. 5. 0	7. 11. 18. 3	4. 0. 59. 53	8. 2. 18. 15	8. 2. 19.	+ 1
1636. Jun 16. 8. 10	2. 7. 21. 49	8. 12. 44. 38	2. 25. 12. 29	2. 25. 12. 1/2	0
Iul. 6. 8. 10	2. 26. 25. 5	11. 4. 35. 26	3. 23. 21. 56	3. 23. 21.	− 1

Lastly, for Compleating our Mercurial Astronomy. *Anno* 1661, *Ap* the 23th, being the day of the Coronation of our most Gracious Soverai King *Charles* the second; That ingenious Gent. *Christianus Hugeniu* of *Zulichem*, Mr. *Reeves*, with other Mathematical friends and my self, b ing together at Long-Acre, by help of a good Talescope, with red gla for saving our eyes, saw ☿ from a little past one until two of Clock, a pearing in the Sun, as a round black spot, below Suns center and to the right hand, that in the Heavens he was above, and to the left from the Suns Cente and entred on the Sun much about one of Clock.

But at or very neer 2h. P.M. supposing the Semi-diameter of ☉ 15'. 45 as by our Calculation, *Hugenius* determined the Distance of the Center ☿ from the Vertical circle passing by the Center of ☉ 4'. 20''. and fro the neerest point of the Suns Visible periphery 3'. 24''. that being ce tainly a little more and this a little less then one fourth part of the Se midiameter of ☉. Afterwards Clouds interposed.

The Diameter of ☿ to the Diameter of ☉ seemed scarce so much a 1 to 100.

At 1h. 58'. *T. A.* Equated 1h. 42'. The Mean Anomaly of the Ear was 10s. 5°. 6'. 57''. the Longitude of ☉ from the first ✱ of ♈ 0s. 15 3'. 9''. from the Æquinox in ♉ 13°. 27'. 24''. The Mean Anomaly ☿ 10s. 17°. 45'. 25''. his Geocentrick Sidereal place 0s. 15°. 14'. 24 with Lat. North 5'. 10''.

Th

The Diſtance of ☉ from the Vertex 42°. 39′. the Angle of the Vertical Circle with the Ecliptick 45°. 34′. the Parallax of ☿ from ☉ in Altitude 8″. the Apparent Semidiameter of ☉ 15′. 45″.

Therefore ☿ was diſtant from the Vertical ~~by~~ the Center of ☉ 4′. 25″. and within his Viſible Periphery 3′. 29″. wch passes through

Alſo the Apparent Semidiameter of ☿ was 9″. that is to the Semid. of ☉ as 1 to 105.

Agreeing with all the Obſerved Proportions.

Refraction of the Stars Obſerved by *Tycho*.

Alt. °	Refract. ′	″
0	30.	0
1	21.	30
2	15.	30
3	12.	30
4	11.	0
5	10.	0
6	9.	0
7	8.	15
8	6.	45
9	6.	0
10	5.	30
11	5.	0
12	4.	30
13	4.	0
14	3.	30
15	3.	0
16	2.	30
17	2.	0
18	1.	15
19	0.	30
20	0.	0

The Cauſe of this Refraction is the Atmoſphere, or thickneſs of the Air neer the face of the Earth; whence the Stars and Planets ſeem alwayes to riſe ſooner and ſet later then really they do. It is varied by the Weather, & in parts more Northerly hath been obſerved much greater; but in cleereſt Air, when the Refraction is leaſt, and within or neer the Latitude of 55°, though *Tycho* admits that of the Sun a little more, we may generally in the appearance of the Luminaries, Planets and Stars, allow about the ſame proportion as in this Table, The uſe whereof is thus;

Suppoſe the Obſerved Altitude of a Star 5°. the Refraction correſpondent is 10′. which ſubſtracted from 5°. the reſidue is the true Altitude 4°. 50′.

Here followeth

A Catologue of ſome famous Places, with their temporary Difference of Meridians from *London*, and Latitudes; the ſituation of thoſe marked with an Aſteriſk being gathered by more certain Cœleſtial Obſervation.

* *Alepo*

page 1

	Differ. Merid. H ′	Latit. ° ′
*Alepo	2.25.ori.	37.20
*Alexandria	2 11.ori.	30.58
*Amsterdam	0.21.ori.	52.25
Antioch	3.31.ori.	36.15
Antwerp	0.18.ori.	51.12
Aracta	3.15.ori.	36. 0
*Aquæ Sextiæ	0.22.ori.	43.33
*Avenio	0.19.ori.	43.52
Babylon	3. 1.ori.	35. 0
*Bermudas	4.14.occ.	32.25
*Bononia Italiæ	0.52.ori.	44.30
Bristol	0.11.occ.	51.28
*Bruxells	0.16.ori	50.48
Cambridge	0. 2.ori.	52.17
Canterbury	0. 5.ori	51.17
Carmarthen	0.17.occ.	52. 2
Cassells	0.36.ori.	51.19
*Cayrum Gran Cair.	2.16.ori.	29.50
Chester	0.10.occ	53.16
Constantinople	2.12.ori.	43. 0
Cork	0.30.occ.	51.45
Cracovia	1.21.ori.	49.58
Damascus	3.16.ori.	34. 0
*Dantzick	1.16.ori.	54 23
*Dinia	0.26.ori.	44. 6
Dublin	0.18.occ.	53.20
Dunkirk	0.12.ori.	51. 2
Edinburg	0.12.occ.	55.57
Florence	0.43.ori.	43.10
Francford Mœn	0.32.ori.	50.10
Francford Oder	1. 0.ori	52.22
Geneva	0.27.ori.	46.15
Gaunt	0.16.ori.	50.55
Grats	1. 4.ori.	47. 2
Gratianopolis	0.27.ori.	45.12
*Haphnia	0.49.ori.	55.43
Hamburg	0.40.ori.	53.43
Heydelberg	0.36.ori.	49.36
Hierusalem	3. 6.ori.	32.10
Hull	0. 1.occ.	53.50

	Differ. Merid. H ′	Latit. ° ′
Leyden	0.19.ori.	52.1
Lincoln	0. 1.occ.	53.1
Lisbon	0.36.occ.	38.5
Liverpool	0.10.occ.	53.2
*LONDON	0. 0.	51.3
Lovan	0.20.ori.	50.5
~~Lugdun. Batav.~~	0.19.ori.	52.1
Madrid	0.18.occ.	40.3
Manchester	0. 9.occ.	53.2
Massilia	0.24.ori.	43.2
*Mexico	6.50.occ.	20.
Milan	0.33.ori.	45.2
Montpellier	0.15.ori.	43.3
Moscua	2.45.ori.	55.3
Munster	0.30.ori.	52.
Naples	1. 0.ori.	41.
Newcastle	0. 1.occ.	55.
Norimberg	0.44.ori.	49.2
Norwich	0. 4.ori.	52.4
Orleans	0. 6.ori.	48.
*Oxford	0. 5.occ.	51.4
*Paris	0.10.ori.	48.5
Patavium	0.46.ori.	45.
Prague	0.56.ori.	50.
Ratisbona	0.50.ori.	49.
Rhodus	2.25.ori.	36.
Rochester	0. 2.ori.	51.3
Rome	0.50.ori.	42.
Salamanca	0.24 occ.	41.1
Shrewsbury	0.11.occ.	52.4
Stetine	0.58.ori.	53.36
Toledo	0.16.occ.	39.5
*Tubing	0.38.ori.	48.3
*Turin	0.32.ori.	44.5
Vienna Aust.	1. 4.ori.	48.22
Vilna	1.50.ori.	54.30
*Uraniburg	0.50.ori.	55.54
VVittenberg	0.52.ori.	51.53
Yarmouth	0. 6 ori.	52.55
York	0.4.occ.	54. 0

TAB.

TABULA DECLINATIONIS ECLIPTICÆ.

Sig.	♈ ♎	♉ ♏	♊ ♐	
°	°. ′. ″.	°. ′. ″.	°. ′. ″.	
0	0. 0. 0.	11.30. 1	20.12. 6	30.
1	0.23.55	11.51. 4	20.24.40	29
2	0.47.51	12.11.56	20.36.51	28
3	1.11.45	12.32.35	20.48.40	27
4	1.35.38	12.53. 2	21. 0. 6	26
5	1.59.30	13.13.17	21.11. 8	25
6	2.23.20	13.33.18	21.21.47	24
7	2.47. 7	13.53. 6	21.32. 2	23
8	3.10.53	14.12.40	21.41.53	22
9	3.34.35	14.32. 0	21.51.19	21
10	3.58.14	14.51. 5	22. 0.21	20
11	4.21.49	15. 9.55	22. 8.58	19
12	4.45.20	15.28.29	22.17.10	18
13	5. 8.47	15.46.48	22.24.57	17
14	5.32. 9	16. 4.51	22.32.18	16
15	5.55.25	16.22.38	22.39.14	15
16	6.18.37	16.40. 7	22.45.43	14
17	6.41.42	16.57.19	22.51.47	13
18	7. 4.41	17.14.14	22.57.24	12
19	7.27.33	17.30.51	23. 2.35	11
20	7.50.18	17.47. 9	23. 7.19	10
21	8.12.56	18. 3. 9	23.11.37	9
22	8.35.26	18.18.49	23.15.28	8
23	8.57.48	18.34.10	23.18.52	7
24	9.20. 2	18.49.12	23.21.49	6
25	9.42. 6	19. 3.53	23.24.19	5
26	10. 4. 1	19.18.14	23.26.22	4
27	10.25.47	19.32.14	23.27.57	3
28	10.47.22	19.45.53	23.29. 5	2
29	11. 8.47	19.59.11	23.29.46	1
30	11.30. 1	20.12. 6	23.30. 0	0
	♓ ♍	♒ ♌	♑ ♋	Sig.

Tabula Ascensionum Rectarum.

Sig.	♈	♉	♊	♋	♌	♍
o	o. '. "	o. '. "	o. '. "	o. '. "	o. '. "	o. '. "
0	0. 0. 0	27.53.59	57.48.25	90. 0. 0	122.11.35	152. 6.1
1	0.55. 1	28.51.21	58.50.58	91. 5.26	123.13.59	153. 3.15
2	1.50. 3	29.48.52	59.53.42	92.10.51	124.16.12	154. 0.21
3	2.45. 6	30.46.33	60.56.35	93.16.15	125.18.14	154.57.18
4	3.40. 9	31.44.22	61.59.38	94.21.38	126.20. 6	155.54. 7
5	4.35.14	32.42.21	63. 2.51	95.26.59	127.21.47	156.50.49
6	5.30.20	33.40.29	64. 6.13	96.32.17	128.23.17	157.47.23
7	6.25.28	34.38.48	65. 9.44	97.37.33	129.24.37	158.43.50
8	7.20.39	35.37.16	66.13.24	98.42.46	130.25.45	159.40.10
9	8.15.52	36.35.54	67.17.12	99.47.56	131.26.43	160.36.24
10	9.11. 7	37.34.42	68.21. 9	100.53. 1	132.27.29	161.32.31
11	10. 6.26	38.33.41	69.25.13	101.58. 2	133.28. 5	162.28.32
12	11. 1.49	39.32.50	70.29.26	103. 2.59	134.28.30	163.24.27
13	11.57.15	40.32.10	71.33.45	104. 7.50	135.28.44	164.20.17
14	12.52.45	41.31.41	72.38.12	105.12.35	136.28.46	165.16. 1
15	13.48.20	42.31.22	73.42.45	106.17.15	137.28.38	166.11.40
16	14.43.59	43.31.14	74.47.25	107.21.48	138.28.19	167. 7.15
17	15.39.43	44.31.16	75.52.10	108.26.15	139.27.50	168. 2.45
18	16.35.33	45.31.30	76.57. 1	109.30.34	140.27.10	168.58.11
19	17.31.28	46.31.55	78. 1.58	110.34.47	141.26.19	169.53.34
20	18.27.29	47.32.31	79. 6.59	111.38.51	142.25.18	170.48.53
21	19.23.36	48.33.17	80.12. 4	112.42.48	143.24. 6	171.44. 8
22	20.19.50	49.34.15	81.17.14	113.46.36	144.22.44	172.39.21
23	21.16.10	50.35.23	82.22.27	114.50.16	145.21.12	173.34.32
24	22.12.37	51.36.43	83.27.43	115.53.47	146.19.31	174.29.40
25	23. 9.11	52.38.13	84.33. 1	116.57. 9	147.17.39	175.24.46
26	24. 5.53	53.39.54	85.38.22	118. 0.22	148.15.38	176.19.51
27	25. 2.42	54.41.46	86.43.45	119. 3.25	149.13.27	177.14.54
28	25.59.39	55.43.48	87.49. 9	120. 6.18	150.11. 8	178. 9.57
29	26.56.45	56.46. 1	88.54.34	121. 9. 2	151. 8.39	179. 4.59
30	27.53.59	57.48.25	90. 0. 0	122.11.35	152. 6. 1	180. 0. 0

Tabula Ascensionum Rectarum.

Sig	♎	♏	♐	♑	♒	♓
0	0. ′ ″	0. ′ ″	0. ′ ″	0. ′ ″	0. ′ ″	0. ′ ″
0	180. 0. 0	207.53.59	237.48.25	270. 0. 0	302.11.35	332. 6. 1
1	180.55. 1	208.51.21	238.50.58	271. 5.26	303.13.59	333. 3.15
2	181.50. 3	209.48.52	239.53.42	272.10.51	304.16.12	334. 0.21
3	182.45. 6	210.46.33	240.56.35	273.16.15	305.18.14	334.57.18
4	183.40. 9	211.44.22	241.59.38	274.21.38	306.20. 6	335.54. 7
5	184.35.14	212.42.21	243. 2.51	275.26.59	307.21.47	336.50.49
6	185.30.20	213.40.29	244. 6.13	276.32.17	308.23.17	337.47.23
7	186.25.28	214.38.48	245. 9.44	277.37.33	309.24.37	338.43.50
8	187.20.39	215.37.16	246.13.24	278.42.46	310.25.45	339.40.10
9	188.15.52	216.35.54	247.17.12	279.47.56	311.26.43	340.36.24
10	189.11. 7	217.34.42	248.21. 9	280.53. 1	312.27.29	341.32.31
11	190. 6.26	218.33.41	249.25.13	281.58. 2	313.28. 5	342.28.32
12	191. 1.49	219.32.50	250.29.26	283. 2.59	314.28.30	343.24.27
13	191.57.15	220.32.10	251.33.45	284. 7.50	315.28.44	344.20.17
14	192.52.45	221.31.41	252.38.12	285.12.35	316.28.46	345.16. 1
15	193.48.20	222.31.22	253.42.45	286.17.15	317.28.38	346.11.40
16	194.43.59	223.31.14	254.47.25	287.21.48	318.28.19	347. 7.15
17	195.39.43	224.31.16	255.52.10	288.26.15	119.27.50	348. 2.45
18	196.35.33	225.31.30	256.57. 1	289.30.34	320.27.10	348.58.11
19	197.31.28	226.31.55	258. 1.58	290.34.47	321.26.19	349.53.34
20	198.27.29	227.32.31	259. 6.59	291.38.51	322.25.18	350.48.53
21	199.23.36	228.33.17	260.12. 4	292.42.48	323.24. 6	351.44. 8
22	200.19.50	229.34.15	261.17.14	293.46.36	324.22.44	352.39.21
23	201.16.10	230.35.23	262.22.27	294.50.16	325.21.12	353.34.32
24	202.12.37	231.36.43	263.27.43	295.53.47	326.19.31	354.29.40
25	203. 9.11	232.38.13	264.33. 1	296.57. 9	327.17.39	355.24.46
26	204. 5.53	233.39.54	265.38.22	298. 0.22	328.15.38	356.19.51
27	205. 2.42	234.41.46	266.43.45	299. 3.25	329.13.27	357.14.54
28	205.59.39	235.43.48	267.49. 9	300. 6.18	330.11. 8	358. 9.57
29	206.56.45	236.46. 1	268.54.34	301. 9. 2	331. 8.39	359. 4.59
30	207.53.59	237.48.25	270. 0. 0	302.11.35	332. 6. 1	360. 0. 0

TABULÆ ÆQUATIONIS TEMPORIS.

Subtrahe ab Apparente.

Locus Solis Verus.

Sig. / gr.	♈ ♎ ′ ″	♉ ♏ ′ ″	♊ ♐ ′ ″	
0	0. 0	8. 24	8. 46	30
1	0.20	8.35	8.36	29
2	0.40	8.45	8.25	28
3	1. 0	8.54	8.14	27
4	1.19	9. 3	8. 1	26
5	1.39	9.11	7.49	25
6	1.59	9.18	7.35	24
7	2.18	9.25	7.21	23
8	2.37	9.31	7. 6	22
9	2.57	9.36	6.51	21
10	3.16	9.41	6.35	20
11	3.34	9.45	6.19	19
12	3.53	9.49	6. 2	18
13	4.11	9.51	5.45	17
24	4.29	9.53	5.27	16
15	4.47	9.55	5. 9	15
16	5. 4	9.55	4.50	14
17	5.21	9.55	4.31	13
18	5.38	9.54	4.12	12
19	5.54	9.52	3.52	11
20	6.10	9.50	3.32	10
21	6.26	9.47	3.12	9
22	6.41	9.43	2.51	8
23	6.55	9.38	2.30	7
24	7.10	9.33	2. 9	6
25	7.23	9.27	1.48	5
26	7.36	9.20	1.27	4
27	7.49	9.13	1. 5	3
28	8. 1	9. 5	0.43	2
29	8.13	8.56	0.22	1
30	8 24	8 46	0. 0	0
	′ ″	′ ″	′ ″	gr.
	♓ · ♍	♒ ♌	♑ · ♋	Sig

Adde ad Apparens.

Adde ad Apparens.

Anomalia Terræ Media.

Sig. / gr.	0 ′ ″	1 ′ ″	2 ′ ″	3 ′ ″	4 ′ ″	5 ′ ″	
0	0 0	3. 54	6. 48	7. 56	6. 57	4. 3	30
1	0. 8	4. 1	6.52	7.56	6.53	3.55	29
2	0.16	4. 8	6.56	7.56	6.49	3.48	28
3	0.24	4.15	7. 0	7.56	6.44	3.40	27
4	0.33	4.22	7. 4	7.56	6.40	3.33	26
5	0.41	4.28	7. 8	7.55	6.35	3.25	25
6	0.49	4.35	7.11	7.55	6.30	3.18	24
7	0.57	4.42	7.15	7.54	6.25	3.10	23
8	1. 5	4.48	7.18	7.53	6.20	3. 2	22
9	1.13	4.55	7.21	7.52	6.15	2.54	21
10	1.21	5. 1	7.24	7.51	6.10	2.46	20
11	1.29	5. 7	7.27	7.49	6. 5	2.38	19
12	1.37	5.14	7.30	7.48	5.59	2.30	18
13	1.45	5.20	7.33	7.46	5.54	2.22	17
14	1.53	5.26	7.35	7.45	5.48	2.14	16
15	2. 1	5.32	7.37	7.43	5.42	2. 6	15
16	2. 9	5.38	7.40	7.41	5.36	1.58	14
17	2.16	5.43	7.42	7.38	5.30	1.49	13
18	2.24	5.49	7.44	7.36	5.24	1.41	12
19	2.32	5.54	7.46	7.34	5.18	1.33	11
20	2.40	6. 0	7.47	7.31	5.11	1.25	10
21	2.47	6. 5	7.49	7.28	5. 5	1.16	9
22	2.55	6.10	7.50	7.25	4.58	1. 8	8
23	3. 2	6.15	7.51	7.22	4.52	0.59	7
24	3.10	6.20	7.53	7.19	4.45	0.51	6
25	3.17	6.25	7.54	7.16	4.38	0.42	5
26	3.25	6.30	7.54	7.12	4.31	0.34	4
27	3.32	6.35	7.55	7. 9	4.24	0.25	3
28	3.39	6.39	7.56	7. 5	4.17	0.17	2
29	3.47	6.44	7.56	7. 1	4.10	0. 8	1
30	3.54	6.48	7.56	6.57	4. 3	0. 0	0
	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	gr.
	11	10	9	8	7	6	Sig.

Subtrahe ab Apparente.

Terræ Tabula Motus Medij ab Aphelio, & Æquinoctij Præcessionis Vernalis, à 1 ✱ ♈.

Ann. Chr. ~~Curr.~~ Incipiens	Anomalia ⊖ s ° ' "	Præ. Æqu s ° ' "
1.	6.23.19.56	0. 6.16.0
1501	6.14 36.11	0.26.16.0
1581	6.14. 8.15	0.27.20.0
1601	6.14. 1.16	0.27.36.0
1621	6.13 54.17	0.27.52.0
1641	6.13.47 18	0.28. 8 0
1661	6.13.40.19	0.28.24.0
1681	6.13.33.20	0.28 40.0
1701	6.13.26.21	0.28.56.0
1721	6.13.19.22	0.29.12.0
1741	6.13.12.23	0.29.28.0
1761	6 13. 5.24	0.29.44.0
1781	6.12.58.25	1. 0. 0.0
1801	6.12.51.26	1. 0.16.0
1901	6.12.16.31	1. 1.36.0
2001	6.11.41.36	1. 2.56.0

An. nis.	Mot. Ano. mal.	Præcess. æqui.
20	11.29.53. 1	0. 0 16.0
40	11.29 46. 2	0. 0.32.0
60	11.29.39. 3	0. 0.48.0
80	11.29.32. 4	0. 1. 4.0
100	11.29.25. 5	0. 1.20.0
200	11.28.50.10	0. 2.40.0
300	11 28.15.15	0. 4. 0.0
400	11.27.40 20	0. 5.20.0
500	11.27. 5.25	0. 6.40 0
600	11.26.30.30	0. 8. 0.0
700	11.25.55.35	0. 9.20.0
800	11.25.20.40	0.10.40.0
900	11.24.45.45	0.12. 0.0
1000	11.24.10.50	0.13.20.0
2000	11.18.21.40	0.26.40.0
3000	11.12.32.30	1.10. 0.0
4000	11. 6.43.20	1.23.20.0
5000	11. 0.54.10	2. 6.40.0
6000	10.25. 5. 0	2.20. 0.0

Annis.	Mot. Anomal s ° ' "	Pr. æq ' "
1	11.29.44 52	0.48
2	11.29.29.44	1.36
3	11 29.14.36	2.24
4	11.29.58.36	3.12
5	11.29.43.28	4. 0
6	11.29 28.20	4 48
7	11.29.13.12	5 36
8	11.29.57.12	6.24
9	11.29.42. 4	7.12
10	11.29.26.56	8. 0
11	11.29.11 48	8.48
12	11.29.55 49	9.36
13	11.29.40.41	10.24
14	11.29.25 33	11.12
15	11.29.10.25	12. 0
16	11 29.54.25	12.48
17	11.29.39.17	13.36
18	11.29.24. 9	14.24
19	11.29. 9. 1	15.12
20	11.29.53. 1	16 0

Mens. A.Cō.	Mot. anomal. s. ° ' "	Pr ' "
Janua.	0. 0. 0. 0	0
Febr.	1. 0.33.14	4
Mart.	1.28. 9. 4	8
April.	2.28.42.18	12
Maij.	3.28.16.24	16
Junij.	4.28.49.38	20
Julij.	5.28.23.44	24
Aug.	6.28.56.58	28
Sept.	7 29.30.12	32
Octo.	8.29. 4.18	36
Nov.	9.29.37.32	40
Decē.	10.29.11.38	44

In Anno Bissextili, post Februarium, adde unum diem & unius diei motum.

Dies.	Mot. Anom. s ° ' "
1	0. 0.59. 8
2	0. 1.58.16
3	0. 2.57.25
4	0. 3.56.33
5	0. 4.55.41
6	0. 5.54.49
7	0. 6.53.57
8	0. 7.53. 6
9	0. 8.52.14
10	0. 9.51.22
11	0.10.50.30
12	0.11.49.38
13	0.12.48.47
14	0.13.47.55
15	0.14.47. 3
16	0.15.46.11
17	0.16.45.19
18	0.17.44.28
19	0.18.43.36
20	0.19.42.44
21	0.20.41.52
22	0.21.41. 0
23	0.22 40. 9
24	0.23.39.17
25	0.24.38 25
26	0.25.37.33
27	0.26.36.41
28	0.27.35.50
29	0.28.34.58
30	0.29.34. 6
31	1. 0.33.14
32	1. 1.32.22

H ' "	Mo. An. ° ' " / ' " ''' / " ''' iv	H. ' "	Mo An. ° ' " / ' " ''' / " ''' iv
1	0. 2.28	31	1.16.23
2	0. 4.56	32	1.18.51
3	0. 7.24	33	1.21.19
4	0. 9.51	34	1.23.47
5	0.12.19	35	1.26.14
6	0.14.47	36	1.28.42
7	0.17.15	37	1.31.10
8	0.19 43	38	1.33.38
9	0.22.11	39	1.36. 6
10	0.24.38	40	1.38.34
11	0.27. 6	41	1.41. 2
12	0.29.34	42	1.43.29
13	0.32. 2	43	1.45.57
14	0.34.30	44	1.48.25
15	0.36.58	45	1.50.53
16	0.39.25	46	1.53.21
17	0.41.53	47	1.55.49
18	0.44.21	48	1.58.16
19	0.46.49	49	2. 0.44
20	0.49.17	50	2. 3.12
21	0.51.45	51	2. 5.40
22	0.54.13	52	2. 8. 8
23	0 56.40	53	2.10.36
24	0.59. 8	54	2.13. 3
25	1. 1.36	55	2.15.31
26	1 .4. 4	56	2.17.59
27	1. 6.32	57	2.20.27
28	1. 9. 0	58	2.22.55
29	1.11. 27	59	2.25.23
30	1.13.55	60	2.27.50

Long. Aph. ⊖ à 1 ✱ ♈		
s.	°.	'.
8.	8.	20.

Dist. med. ⊖ à ☉ —— 100000
Eccentricitas. —— ——1732

Terræ Tabula Æquationis.

Anō med.	Sig. 0 Sub	Sig. 1 Sub	Sig. 2 Sub	Sig. 3 Sub	Sig. 4 Sub	Sig. 5 Sub	
°	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	°
0	0. 0. 0	0.58.27	1.42. 1	1.59. 4	1.44.15	1. 0.41	30
1	0. 2. 2	1. 0.13	1.43. 4	1.59. 6	1.43.13	0.58.51	29
2	0. 4. 4	1. 1.58	1.44. 4	1.59. 5	1.42. 9	0.57. 0	28
3	0. 6. 6	1. 3.42	1.45. 4	1.59. 2	1.41. 3	0.55. 7	27
4	0. 8. 8	1. 5.25	1.46. 1	1.58.57	1.39.55	0.53.14	26
5	0.10.10	1. 7. 6	1.46.56	1.58.50	1.38.46	0.51.20	25
6	0.12.11	1. 8.47	1.47.50	1.58.41	1.37.34	0.49.25	24
7	0.14.12	1.10.27	1.48.41	1.58.30	1.36.21	0.47.28	23
8	0.16.13	1.12. 5	1.49.31	1.58.16	1.35. 6	0.45.31	22
9	0.18.14	1.13.42	1.50.18	1.58. 0	1.33.49	0.43.33	21
10	0.20.15	1.15.17	1.51. 4	1.57.42	1.32.30	0.41.35	20
11	0.22.15	1.16.52	1.51.48	1.57.22	1.31.10	0.39.35	19
12	0.24.15	1.18.25	1.52.29	1.57. 0	1.29.47	0.37.34	18
13	0.26.14	1.19.57	1.53. 9	1.56.35	1.28.23	0.35.33	17
14	0.28.13	1.21.27	1.53.47	1.56. 8	1.26.58	0.33.31	16
15	0.30.11	1.22.56	1.54.22	1.55.40	1.25.30	0.31.29	15
16	0.32. 9	1.24.23	1.54.56	1.55. 9	1.24. 1	0.29.26	14
17	0.34. 7	1.25.49	1.55.27	1.54.35	1.22.31	0.27.22	13
18	0.36. 3	1.27.13	1.55.57	1.54. 0	1.20.59	0.25.18	12
19	0.38. 0	1.28.36	1.56.24	1.53.23	1.19.25	0.23.13	11
20	0.39.55	1.29.58	1.56.40	1.52.43	1.17.50	0.21. 8	10
21	0.41.50	1.31.18	1.57.12	1.52. 2	1.16.13	0.19. 2	9
22	0.43.44	1.32.36	1.57.33	1.51.18	1.14.35	0.16.56	8
23	0.45.37	1.33.52	1.57.52	1.50.32	1.12.55	0.14.50	7
24	0.47.30	1.35. 7	1.58. 9	1.49.44	1.11.14	0.12.43	6
25	0.49.21	1.36.20	1.58.23	1.48.55	1. 9.32	0.10.36	5
26	0.51.12	1.37.32	1.58.36	1.48. 3	1. 7.48	0. 8.29	4
27	0.53. 2	1.38.42	1.58.46	1.47. 9	1. 6. 3	0. 6.22	3
28	0.54.51	1.39.50	1.58.54	1.46.14	1. 4.17	0. 4.15	2
29	0.56.39	1.40.56	1.59. 0	1.45.15	1. 2.29	0. 2. 7	1
30	0.58.27	1.42. 1	1.59. 4	1.44.15	1. 0.41	0. 0. 0	0
	Sig 11. Add	Sig. 10. Add.	Sig. 9. Add.	Sig. 8. Add.	Sig. 7. Add.	Sig. 6. Add.	An

SOLIS TABULA LOCI GEOCENTRICI.

Anomalia Terræ Media.

Sig	0	1	2	3	4	5
	Lo.☉a 1 ✱ ♈	Lo.☉a 1 ✱ ♈	Lo.☉a 1 ✱ ♈	Lo.☉a 1 ✱ ♈	Lo.☉a 1 ✱ ♈	Lo.☉a 1 ✱ ♈
o	s. o. ' "	s. o. ' "	s. o. ' "	s. o. ' "	s. o. ' "	s. o. ' "
0	2. 8.20. 0	3. 7.21.33	4. 6.37.59	5. 0.20.56	6. 6.35.45	7. 7.19.19
1	2. 9.17.58	3. 8.19.47	4. 7.36.56	5. 7.20.54	6. 7.36.47	7. 8.21. 9
2	2.10.15.56	3. 9.18. 2	4. 8.35.56	5. 8.20.55	6. 8.37.51	7. 9.23. 0
3	2.11.13.54	3.10.16.18	4. 9.34.56	5. 9.20.58	6. 9.38.57	7.10.24.53
4	2.12.11.52	3.11.14.35	4.10.33.59	5.10.21. 3	6.10.40. 5	7.11.26.46
5	2.13. 9.50	3.12.12.54	4.11.33. 4	5.11.21.10	6.11.41.14	7.12.28.40
6	2.14. 7.49	3.13.11.13	4.12.32.10	5.12.21.19	6.12.42.26	7.13.30.35
7	2.15. 5.48	3.14. 9.33	4.13.31.19	5.13.21.30	6.13.43.39	7.14.32.32
8	2.16. 3.47	3.15. 7.55	4.14.30.29	5.14.21.44	6.14.44.54	7.15.34.29
9	2.17. 1.46	3.16. 6.18	4.15.29.42	5.15.22. 0	6.15.46.11	7.16.36.27
10	2.17.59.45	3.17. 4.43	4.16.28.56	5.16.22.18	6.16.47.30	7.17.38.25
11	2.18.57.45	3.18. 3. 8	4.17.28.12	5.17.22.38	6.17.48.50	7.18.40.25
12	2.19.55.45	3.19. 1.35	4.18.27.31	5.18.23. 0	6.18.50.13	7.19.42.26
13	2.20.53.46	3.20. 0. 3	4.19.26.51	5.19.23.25	6.19.51.37	7.20.44.27
14	2.21.51.47	3.20.58.33	4.20.26.13	5.20.23.52	6.20.53. 2	7.21.46.29
15	2.22.49.49	3.21.57. 4	4.21.25.38	5.21.24.20	6.21.54.30	7.22.48.31
16	2.23.47.51	3.22.55.37	4.22.25. 4	5.22.24.51	6.22.55.59	7.23.50.34
17	2.24.45.53	3.23.54.11	4.23.24.33	5.23.25.25	6.23.57.29	7.24.52.38
18	2.25.43.57	3.24.52.47	4.24.24. 3	5.24.26. 0	6.24.59. 1	7.25.54.42
19	2.26.42. 0	3.25.51.24	4.25.23.36	5.25.26.37	6.26. 0.35	7.26.56.47
20	2.27.40. 5	3.26.50. 2	4.26.23.11	5.26.27.17	6.27. 2.10	7.27.58.52
21	2.28.38.10	3.27.48.42	4.27.22.48	5.27.27.58	6.28. 3.47	7.29. 0.58
22	2.29.36.16	3.28.47.24	4.28.22.27	5.28.28.42	6.29. 5.25	8. 0. 3. 4
23	3. 0.34.23	3.29.46. 8	4.29.22. 8	5.29.29.28	7. 0. 7. 5	8. 1. 5.10
24	3. 1.32.30	4. 0.44.53	5. 0.21.51	6. 0.30.16	7. 1. 8.46	8. 2. 7.17
25	3. 2.30.39	4. 1.43.40	5. 1.21.37	6. 1.31. 5	7. 2.10.28	8. 3. 9.24
26	3. 3.28.48	4. 2.42.28	5. 2.21.24	6. 2.31.57	7. 3.12.12	8. 4.11.31
27	3. 4.26.58	4. 3.41.18	5. 3.21.14	6. 3.32.51	7. 4.13.57	8. 5.13.38
28	3. 5.25. 9	4. 4.40.10	5. 4.21. 6	6. 4.33.46	7. 5.15.43	8. 6.15.45
29	3. 6.23.21	4. 5.39. 4	5. 5.21. 0	6. 5.34.45	7. 6.17.31	8. 7.17.53
30	3. 7.21.33	4. 6.37.59	5. 6.20.56	6. 6.35.45	7. 7.19.19	8. 8.20. 0

SOLIS TABULA LOCI GEOCENTRICI.

Anomalia Terræ Media.

Sig.	6	7	8	9	10	11
	Lo.☉a 1 * ♈	Lo.☉a 1 * ♈	Lo.☉a 1 * ♈	Lo.☉a 1 * ♈	Lo.☉a 1 * ♈	Lo.☉a 1 * ♈
°	s. °. ′. ″	s. °. ′. ″	s. °. ′. ″	s. °. ′. ″	s. °. ′. ″	s. °. ′. ″
0	8. 8.20. 0	9. 9.20.41	10.10. 4.15	11.10.19. 4	0.10. 2. 1	1. 9.18.27
1	8. 9.22. 7	9.10.22.29	10.11. 5.15	11.11.19. 0	0.11. 0.56	1.10.16.39
2	8.10.24.15	9.11.24.17	10.12. 6.14	11.12.18.54	0.11.59.50	1.11.14.51
3	8.11.26.22	9.12.26. 3	10.13. 7. 9	11.13.18.46	0.12.58.42	1.12.13. 2
4	8.12.28.29	9.13.27.48	10.14. 8. 3	11.14.18.36	0.13.57.32	1.13.11.12
5	8.13.30.36	9.14.29.32	10.15. 8.55	11.15.18.23	0.14.56.20	1.14. 9.21
6	8.14.32.43	9.15.31.14	10.16. 9.44	11.16.18. 9	0.15.55. 7	1.15. 7.30
7	8.15.34.50	9.16.32.55	10.17.10.32	11.17.17.52	0.16.53.52	1.16. 5.37
8	8.16.36.56	9.17.34.35	10.18.11.18	11.18.17.33	0.17.52.36	1.17. 3.44
9	8.17.39. 2	9.18.36.13	10.19.12. 2	11.19.17.12	0.18.51.18	1.18. 1.50
10	8.18.41. 8	9.19.37.50	10.20.12.43	11.20.16.49	0.19.49.58	1.18.59.55
11	8.19.43.13	9.20.39.25	10.21.13.23	11.21.16.24	0.20.48.36	1.19.58. 0
12	8.20.45.18	9.21.40.59	10.22.14. 0	11.22.15.57	0.21.47.13	1.20.56. 3
13	8.21.47.22	9.22.42.31	10.23.14.35	11.23.15.27	0.22.45.49	1.21.54. 7
14	8.22.49.26	9.23.44. 1	10.24.15. 9	11.24.14.56	0.23.44.23	1.22.52. 9
15	8.23.51.29	9.24.45.30	10.25.15.40	11.25.14.22	0.24.42.56	1.23.50.11
16	8.24.53.31	9.25.46.58	10.26.16. 8	11.26.13.47	0.25.41.27	1.24.48.13
17	8.25.55.33	9.26.48.23	10.27.16.35	11.27.13. 9	0.26.39.57	1.25.46.14
18	8.26.57.34	9.27.49.47	10.28.17. 0	11.28.12.29	0.27.38.25	1.26.44.15
19	8.27.59.35	9.28.51.10	10.29.17.22	11.29.11.48	0.28.36.52	1.27.42.15
20	8.29. 1.35	9.29.52.30	11. 0.17.42	0. 0.11. 4	0.29.35.17	1.28.40.15
21	9. 0. 3.33	10.0.53.49	11. 1.18. 0	0. 1.10.18	1. 0.33.42	1.29.38.14
22	9. 1. 5.31	10.1.55. 6	11. 2.18.16	0. 2. 9.31	1. 1.32. 5	2. 0.36.13
23	9. 2. 7.28	10.2.56.21	11. 3.18.30	0. 3. 8.41	1. 2.30.27	2. 1.34.12
24	9. 3. 9.25	10.3.57.34	11. 4.18.41	0. 4. 7.50	2. 3.28.47	2. 2.32.11
25	9. 4.11.20	10.4.58.46	11. 5.18.50	0. 5. 6.56	1. 4.27. 6	2. 3.30.10
26	9. 5.13.14	10.5.59.55	11. 6.18.57	0. 6. 6. 1	1. 5.25.25	2. 4.28. 8
27	9. 6.15. 7	10.7. 1. 3	11. 7.19. 2	0. 7. 5. 4	1. 6.23.42	2. 5.26. 6
28	9. 7.17. 0	10.8. 2. 9	11. 8.19. 5	0. 8. 4. 4	1. 7.21.58	2. 6.24. 4
29	9. 8.18.51	10.9. 3.13	11. 9.19. 6	0. 9. 3. 4	1. 8.20.13	2. 7.22. 2
30	9. 9.20.41	10.10.4.15	11.10.19. 4	0.10. 2. 1	1. 9.18.27	2. 8.20. 0

Tabula Logarithmorum à Sole Terræ Distantiarum.

Anomalia Terræ Media.

°	Sig. 0	Sig. 1	Sig. 2	Sig. 3	Sig. 4	Sig. 5	°
0	5.007458	5.006497	5.003840	5.000130	4.996323	4.993470	30
1	5.007456	5.006433	5.003729	4.999999	4.996207	4.993402	29
2	5.007453	5.006367	5.003617	4.999868	4.996092	4.993337	28
3	5.007448	5.006300	5.003503	4.999736	4.995978	4.993274	27
4	5.007440	5.006231	5.003388	4.999605	4.995865	4.993213	26
5	5.007430	5.006160	5.003272	4.999474	4.995754	4.993154	25
6	5.007418	5.006087	5.003155	4.999342	4.995644	4.993096	24
7	5.007404	5.006012	5.003037	4.999211	4.995535	4.993041	23
8	5.007388	5.005935	5.002918	4.999080	4.995427	4.992988	22
9	5.007370	5.005857	5.002799	4.998949	4.995321	4.992938	21
10	5.007350	5.005777	5.002678	4.998819	4.995216	4.992890	20
11	5.007327	5.005695	5.002556	4.998689	4.995113	4.992844	19
12	5.007302	5.005611	5.002434	4.998559	4.995012	4.992800	18
13	5.007275	5.005526	5.002311	4.998430	4.994912	4.992759	17
14	5.007246	5.005439	5.002187	4.998301	4.994813	4.992720	16
15	5.007214	5.005350	5.002062	4.998172	4.994716	4.992683	15
16	5.007180	5.005260	5.001937	4.998044	4.994621	4.992648	14
17	5.007145	5.005168	5.001811	4.997916	4.994527	4.992616	13
18	5.007107	5.005074	5.001685	4.997789	4.994435	4.992586	12
19	5.007067	5.004979	5.001558	4.997662	4.994345	4.992558	11
20	5.007025	5.004883	5.001430	4.997536	4.994256	4.992533	10
21	5.006982	5.004785	5.001302	4.997411	4.994169	4.992510	9
22	5.006936	5.004685	5.001173	4.997287	4.994084	4.992490	8
23	5.006888	5.004584	5.001044	4.997163	4.994001	4.992472	7
24	5.006838	5.004482	5.000914	4.997040	4.993919	4.992456	6
25	5.006786	5.004378	5.000784	4.996918	4.993839	4.992443	5
26	5.006732	5.004273	5.000654	4.996797	4.993761	4.992432	4
27	5.006676	5.004167	5.000523	4.996677	4.993686	4.992423	3
28	5.006618	5.004059	5.000392	4.996558	4.993612	4.992417	2
29	5.006558	5.003950	5.000261	4.996440	4.993540	4.992414	1
30	5.006497	5.003840	5.000130	4.996323	4.993470	4.992412	0
	Sig. 11	Sig. 10	Sig. 9	Sig. 8	Sig. 7	Sig. 6	

L U N Æ

Tabula Mediorum Motuum.

Ann. Chri. Cur.	Anomalia ☽ s ° ' "	Apo. ab Æq. s ° ' "	☊ ab æqui. s ° ' "
1.	6.20.12.45	9.12 15.0	8.28.51. 0
1501	9 29.54. 0	3.29.45.0	1.25 43.30
1581	3. 8.49. 0	4 15. 5.0	10. 8 21.30
1601	4.18.32.45	7.18.55.0	9.11.31. 0
1621	5.28.16.30	10.22.45 0	8.14.40.30
1641	7. 8. 0.15	1.26.35.0	7.17.50. 0
1661	8.17.44. 0	5. 0.25.0	6.20.59.30
1681	9.27 27.45	8. 4.15.0	5.24 9. 0
1701	11. 7.11.30	11. 8. 5.0	4.27.18.30
1721	0.16.55.15	2.11.55.0	4 0.28. 0
1741	1.26 39. 0	5.15.45.0	3. 3.37.30
1761	3. 6.22.45	8.19.35.0	2. 6.47. 0
1781	4.16. 6.30	11.23.25.0	1. 9.56.30
1801	5.25.50.15	2.27 15.0	0.13. 6. 0
1901	0 14.29. 0	6.16.25.0	7.28 53.30
2001	7. 3. 7 45	10. 5.35.0	3.14.41. 0

An. nis.	Mot. Anũ. ☽ s ° ' "	mot. Apog. s ° ' "	mot. ☊ ret. s ° ' "
20	1. 9.43.45	3. 3.50.0	0.26.50.30
40	2.19.27.30	6. 7.40.0	1.23.41. 0
60	3.29.11.15	9.11.30.0	2.20.31.30
80	5. 8.55. 0	0.15.20.0	3.17.22. 0
100	6.18.38.45	3.19 10.0	4.14.12.30
200	1. 7 17.30	7 8 20.0	8.28.25. 0
300	7.25.56.15	10 27.30.0	1.12.37.30
400	2.14 35. 0	2.16.40.0	5.26.50. 0
500	9. 3.13.45	6. 5 50 0	10.11. 2.30
600	3.21.52.30	9.25. 0.0	2.25.15. 0
700	10.10.31.15	1.14.10.0	7. 9.27.30
800	4.29.10 0	5. 3.20.0	11.23.40. 0
900	11.17.48.45	8 22.30.0	4. 7 52.30
1000	6. 6 27.30	0 11.40.0	8.22. 5. 0
2000	0.12.55. 0	0.23.20.0	5.14.10. 0
3000	6.19 22.30	1. 5. 0.0	2. 6.15. 0
4000	0.25.50. 0	1.16 40.0	10.28.20. 0
5000	7. 2 17.30	1 28.20.5	7.20.25. 0
6000	1. 8.45. 0	2.10. 0.0	4.12.30. 0

An- nis.	Mo. Anom. ☽ s ° ' "	mot. Apog. s ° ' "	mot. ☊ ret. s ° ' "
1	2.28.43.13	1.10.39.50	0.19 19.44
2	5.27.26.26	2.21.19.39	1. 8.39.28
3	8.26. 9.38	4. 1.59 29	1.27.59.12
4	0. 7.56.45	5.12.46. 0	2.17.22 6
5	3. 6.39.58	6.23.25.50	3. 6.41.50
6	6. 5 23.11	8. 4. 5 39	3 26. 1.34
7	9. 4. 6.23	9.14.45.29	4.15.21.18
8	0 15.53.30	10 25.32. 0	5. 4.44 12
9	3.14 36.43	0. 6.11.50	5.24. 3.56
10	6.13.19.56	1.16.51.39	6.13.23.40
11	9.12. 3. 8	2 27.31.29	7. 2.43.24
12	0.23.50.15	4. 8 18. 0	7.22 .6.18
13	3.22.33.28	5.18.57.50	8 11.26. 2
14	6 21.16 41	6.29.37.39	9 0 45.46
15	9.19.59.53	8.10.17.29	9.20. 5.30
16	1. 1.47. 0	9.21. 4. 0	10. 9.28.24
17	4. 0.30.13	11. 1 43.50	10.28.48. 8
18	6.29.13.26	0.12.23.39	11.18. 7.52
19	9.27.56.38	1.23. 3.29	0. 7.27.36
20	1. 9.43.45	3. 3 50. 0	0.26.50.30

Menſ. A.Cõ	Mo. Anom. ☽ s ° ' "	mot. Apog s ° ' "	mot ☊ ret. ° ' "
Janua.	0. 0. 0. 0	0. 0. 0. 0	0. 0. 0
Febr.	1.15. 0.53	0. 3.27.13	1.38.30
Mart.	1.20.50. 3	0. 6.34.23	3. 7.28
April.	3. 5.50.56	0.10. 1.36	4.45.58
Maij.	4 7.47.54	0 13.22. 8	6.21.17
Junij.	5.22.48.47	0.16.49.21	7.59.47
Julij.	6.24.45.45	0.20. 9.53	9.35. 6
Aug.	8. 9.46.38	0.23.37. 6	11.13.36
Sept.	9.24.47.31	0.27. 4.19	12.52. 6
Octo.	10.26.44.29	1. 0.24.51	14.27.25
Nov.	0.11.45.22	1. 3.52. 5	16. 5.55
Decē.	1.13.42.20	1. 7.12.37	17.41.14

In Anno Biſsextili poſt Februarium adde unum diem & unius diei motum.

L u NÆ

Tabula Mediorum Motuum.

Dies.	mot anom. ☽	mot Ap	mo. ☊ ret
	s. o. ' ''	o. ' ''	o. ' ''
1	0.13. 3.54	0. 6.41	0. 3. 11
2	0.26. 7 48	0.13.22	0. 6. 21
3	1. 9.11.42	0.20. 3	0. 9. 32
4	1.22.15.36	0.26.44	0.12. 43
5	2. 5.19.30	0.33.25	0.15. 53
6	2.18.23.24	0.40. 6	0.19. 4
7	3. 1.27.18	0.46.47	0.22. 14
8	3.14.31.12	0.53.29	0.25. 25
9	3.27.35. 6	1. 0.10	0.28. 36
10	4.10.39. 0	1. 6.51	0.31. 46
11	4.23.42.53	1.13.32	0 34. 57
12	5. 6.46.47	1.20.13	0.38. 8
13	5.19.50.41	1.26.54	0.41. 18
14	6. 2.54.35	1.33.35	0.44. 29
15	6.15.58.29	1.40.16	0.47. 40
16	6.29. 2.23	1.46.57	0.50. 50
17	7.12 6.17	1.53.38	0.54. 1
18	7.25.10.11	2. 0.19	0.57. 12
19	8. 8.14. 5	2. 7. 0	1. 0. 22
20	8.21.17.59	2.13.41	1. 3. 33
21	9. 4.21.53	2.20.22	1. 6. 43
22	9.17.25 47	2.27. 3	1. 9. 54
23	10. 0.29.41	2.33.45	1.13. 5
24	10.13.33.35	2.40.26	1.16. 15
25	10.26.37.29	2.47. 7	1.19. 26
26	11. 9.41.23	2.53.48	1.22. 37
27	11.22.45.17	3. 0.29	1.25. 47
28	0. 5.49.11	3. 7.10	1.28. 58
29	0.18.53. 5	3.13.51	1.32. 9
30	1. 1.56.59	3.20.32	1 35. 19
31	1.15. 0.53	3.27.13	1.38. 30
32	1.28. 4.46	3.33.54	1.41. 41

Hor.	mot. anom.	Apog.	☊ r.
	o. '. ''	' ''	'. ''
'.	'. ''. '''	''. '''	''.'''
''.	''. '''. iv	''' iv	'''.iv
1	0.32.40	0.17	0. 8
2	1. 5.19	0.33	0.16
3	1.37.59	0.50	0.24
4	2.10.39	1. 7	0.32
5	2.43.19	1.24	0.40
6	3.15.58	1.40	0.48
7	3.48.38	1.57	0.56
8	4 21.18	2.14	1. 4
9	4 53.58	2.30	1.11
10	5.26.37	2.47	1.19
11	5.59.17	3. 4	1.27
12	6.31.57	3 21	1.35
13	7. 4.37	3.37	1.43
14	7.37 16	3.54	1.51
15	8. 9.56	4 11	1.59
16	8.42.36	4 27	2. 7
17	9.15 16	4.44	2.15
18	9.47.55	5. 1	2.23
19	10.20 35	5.18	2 31
20	10.53.15	5.34	2 39
21	11.25.55	5.51	2.47
22	11.58.34	6. 8	2.55
23	12.31.14	6.24	3. 3
24	13. 3.54	6.41	3.11
25	13.36.34	6.58	3.19
26	14. 9.13	7.14	3.27
27	14.41.53	7.31	3.34
28	15.14.33	7.48	3.42
29	15.47.13	8. 5	3.50
30	16.19.52	8.21	3.58

H.	mo. anom.	Apog.	☊ r.
	o. '. ''	'. ''	'. ''
'.	'. ''. '''.	''. '''	''.'''
''.	''. '''. iv	'''. iv	'''. iv
31	16.52 32	8.38	4. 6
32	17.25. 12	8.55	4.14
33	17.57. 52	9 11	4 22
34	18.30. 31	9 28	4.30
35	19. 3. 11	9.45	4.38
36	19.35. 51	10. 2	4.46
37	20. 8. 31	10 18	4.54
38	20.41. 10	10.35	5. 2
39	21.13. 50	10.52	5.10
40	21.46. 30	11. 8	5.18
41	22.19. 10	11.25	5.26
42	22.51. 49	11 42	5.34
43	23.24. 29	11.59	5.42
44	23.57. 9	12.15	5.50
45	24.29. 49	12.32	5.57
46	25. 2. 28	12.49	6. 5
47	25.35. 8	13. 5	6 13
48	26. 7. 48	13.22	6.21
49	26.40. 28	13.39	6 29
50	27 13. 7	13.56	6.37
51	27.45. 47	14.12	6.45
52	28.18. 27	14.29	6.53
53	28.51. 7	14.46	7. 1
54	29.23. 46	15. 2	7. 9
55	29.56. 26	15.19	7.17
56	30.29 6	15.36	7.25
57	31. 1. 46	15.53	7.33
58	31.34. 25	16. 9	7.41
59	32. 7. 5	16.26	7.49
60	32.39. 45	16.43	7.57

Tabula Æquationis Eccentrici.

Anomalia ☽ media.	Sig. 0. Sub. / Sig. 6. Add.	Sig. 1. Sub / Sig. 7. add.	Sig. 2. Sub. / Sig. 8. add.	
0	0. ′. ″	0. ′. ″	0. ′. ″	0
0	0. 0. 0	2.30.43	4.21.13	30
1	0. 5.16	2.35.15	4.23.49	29
2	0.10.31	2.39.44	4.26.20	28
3	0.15.46	2.44.11	4.28.46	27
4	0.21. 1	2.48.34	4.31. 7	26
5	0.26.16	2.52.55	4.33.23	25
6	0.31.30	2.57.12	4.35.35	24
7	0.36.43	3. 1.26	4.37.41	23
8	0.41.56	3. 5.37	4.39.42	22
9	0.47. 8	3. 9.44	4.41.38	21
10	0.52.20	3.13.48	4.43.29	20
11	0.57.30	3.17.48	4.45.15	19
12	1. 2.39	3.21.45	4.46.55	18
13	1. 7.47	3.25.38	4.48.30	17
14	1.12.54	3.29.27	4.50. 0	16
15	1.18. 0	3.33.13	4.51.25	15
16	1.23. 4	3.36.54	4.52.44	14
17	1.28. 7	3.40.32	4.53.58	13
18	1.33. 8	3.44. 6	4.55. 7	12
19	1.38. 7	3.47.35	4.56.10	11
20	1.43. 5	3.51. 1	4.57. 8	10
21	1.48. 0	3.54.22	4.58. 0	9
22	1.52.54	3.57.39	4.58.47	8
23	1.57.46	4. 0.51	4.59.28	7
24	2. 2.35	4. 3.59	5. 0. 4	6
25	2. 7.23	4. 7. 3	5. 0.34	5
26	2.12. 8	4.10. 2	5. 0.59	4
27	2.16.50	4.12.57	5. 1.18	3
28	2.21.30	4.15.47	5. 1.32	2
29	2.26. 8	4.18.32	5. 1.41	1
30	2.30.43	4.21.13	5. 1.43	0
	Sig. 11. add. / Sig. 5. Sub.	Sig. 10. add. / Sig. 4. Sub	Sig. 9. add / Sig. 3. Sub.	Anomalia ☽ media.

Tabula Reflectionis.

Dist. ☽ à ☉ dupl.	Sig. 0 add / Sig. 6. Sub	Sig. 1. add / Sig. 7. Sub	Sig. 2. add / Sig. 8. Sub	
0	′. ″	′. ″	′. ″	0
0	0. 0	18.47	32.31	30
1	0.39	19.20	32.51	29
2	1.19	19.54	33. 9	28
3	1.58	20.27	33.28	27
4	2.37	21. 0	33.45	26
5	3.16	21.32	34. 2	25
6	3.56	22. 4	34.18	24
7	4.35	22.36	34.34	23
8	5.14	23. 7	34.49	22
9	5.53	23.38	35. 4	21
10	6.31	24. 8	35.17	20
11	7.10	24.38	35.30	19
12	7.48	25. 8	35.43	18
13	8.27	25.37	35.55	17
14	9. 5	26. 5	36. 6	16
15	9.43	26.33	36.16	15
16	10.21	27. 1	36.26	14
17	10.59	27.28	36.35	13
18	11.36	27.54	36.44	12
19	12.14	28.21	36.52	11
20	12.51	28.46	36.59	10
21	13.27	29.11	37. 6	9
22	14. 4	29.36	37.11	8
23	14.40	30. 0	37.16	7
24	15.16	30.23	37.21	6
25	15.52	30.46	37.25	5
26	16.28	31. 8	37.28	4
27	17. 3	31.30	37.30	3
28	17.38	31.51	37.32	2
29	18.12	32.11	37.33	1
30	18.47	32.31	37.33	0
	Si. 11. Sub / Sig. 5 add	Si. 10. Sub / Sig. 4 add	Sig. 9. Sub / Sig. 3 add	Dist. ☽ à ☉ dupl.

Diametri Circelli Evectionis Logarithmus.---------3.640432.

Tabula Logarithmorum à Terra Lunæ Distantiarum.

Anomalia ☽ Media.

°	Sig. 0	Sig. 1	Sig. 2	Sig. 3	Sig. 4	Sig. 5	°
0	5.029668	5.026200	5.016277	5.001610	4.985591	4.972970	30
1	5.029664	5.025968	5.015851	5.001074	4.985088	4.972665	29
2	5.029653	5.025728	5.015419	5.000537	4.984588	4.972368	28
3	5.029633	5.025482	5.014982	4.999998	4.984093	4.972081	27
4	5.029606	5.025228	5.014540	4.999458	4.983602	4.971802	26
5	5.029571	5.024967	5.014093	4.998917	4.983116	4.971534	25
6	5.029528	5.024699	5.013640	4.998375	4.982634	4.971274	24
7	5.029477	5.024424	5.013183	4.997832	4.982158	4.971025	23
8	5.029419	5.024142	5.012722	4.997290	4.981686	4.970785	22
9	5.029353	5.023853	5.012255	4.996747	4.981220	4.970555	21
10	5.026279	5.023557	5.011784	4.996203	4.980759	4.970335	20
11	5.029197	5.023254	5.011309	4.995659	4.980304	4.970126	19
12	5.029108	5.022944	5.010830	4.995117	4.979856	4.969927	18
13	5.029012	5.022628	5.010346	4.994575	4.979412	4.969738	17
14	5.028907	5.022304	5.009858	4.994033	4.978975	4.969559	16
15	5.028794	5.021974	5.009367	4.993492	4.978545	4.969391	15
16	5.028674	5.021638	5.008871	4.992952	4.978120	4.969232	14
17	5.028547	5.021294	5.008371	4.992412	4.977703	4.969085	13
18	5.028411	5.020945	5.007869	4.991874	4.977293	4.968948	12
19	5.028268	5.020590	5.007363	4.991337	4.976890	4.968822	11
20	5.028118	5.020228	5.006853	4.990803	4.976494	4.968706	10
21	5.027960	5.019860	5.006341	4.990270	4.976106	4.968602	9
22	5.027794	5.019485	5.005826	4.989739	4.975724	4.968509	8
23	5.027621	5.019105	5.005307	4.989211	4.975351	4.968427	7
24	5.027440	5.018718	5.004786	4.988685	4.974986	4.968355	6
25	5.027252	5.018326	5.004262	4.988162	4.974629	4.968294	5
26	5.027057	5.017928	5.003736	4.987641	4.974280	4.968244	4
27	5.026854	5.017523	5.003207	4.987124	4.973939	4.968206	3
28	5.026643	5.017113	5.002677	4.986610	4.973607	4.968179	2
29	5.026425	5.016698	5.002144	4.986099	4.973284	4.968162	1
30	5.026200	5.016277	5.001610	4.985591	4.972970	4.968156	0
	Sig. 11	Sig. 10	Sig. 9	Sig. 8	Sig. 7	Sig. 6	

Tabula Æquationis Nodorum Lunæ.

Dist. ☽ à ☉ dupl.	Sig. 0 Sub. / Sig. 6. Add.	Sig. 1. Sub. / Sig. 7. Add.	Sub. 2. Sub. / Sig. 8. Add.	
0	0. ′. ″	0. ′. ″	0. ′. ″	0
0	0. 0. 0	0.52.30	1.30.56	30
1	0. 1.50	0.54. 4	1.31.50	29
2	0. 3.40	0.55.38	1.32.42	28
3	0. 5.30	0.57.11	1.33.33	27
4	0. 7.19	0.58.43	1.34.22	26
5	0. 9. 9	1. 0.13	1.35.10	25
6	0.10.58	1. 1.43	1.35.55	24
7	0.12.48	1. 3.11	1.36.39	23
8	0.14.37	1. 4.38	1.37.21	22
9	0.16.25	1. 6. 4	1.38. 1	21
10	0.18.14	1. 7.29	1.38.40	20
11	0.20. 2	1. 8.53	1.39.17	19
12	0.21.50	1.10.15	1.39.52	18
13	0.23.37	1.11.36	1.40.25	17
14	0.25.24	1.12.56	1.40.56	16
15	0.27.10	1.14.15	1.41.25	15
16	0.28.56	1.15.31	1.41.53	14
17	0.30.42	1.16.47	1.42.18	13
18	0.32.27	1.18. 2	1.42.42	12
19	0.34.11	1.19.14	1.43. 4	11
20	0.35.54	1.20.26	1.43.24	10
21	0.37.37	1.21.36	1.43.42	9
22	0.39.20	1.22.44	1.43.59	8
23	0.41. 1	1.23.51	1.44.13	7
24	0.42.42	1.24.57	1.44.26	6
25	0.44.22	1.26. 0	1.44.36	5
26	0.46. 1	1.27. 3	1.44.45	4
27	0.47.40	1.28. 3	1.44.51	3
28	0.49.17	1.29. 2	1.44.56	2
29	0.50.54	1.30. 0	1.44.59	1
30	0.52.30	1.30.56	1.45. 0	0
	Sig. 11. Add. / Sig. 5. Sub.	Sig. 10. Add. / Sig. 4. Sub.	Sig. 9. Add. / Sig. 3. Sub.	Dist ☽ a ☉ du

Tabula Excessus Lunæ Latitudinis maximæ amplius 5 gradibus.

Dist. ☽ à ☉	Sig. 0. / Sig. 6.	Sig. 1. / Sig. 7.	Sig. 2. / Sig. 8.	
0	′. ″	′. ″	′. ″	0
0	0. 0	4.30	13.30	30
1	0. 0	4.46	13.46	29
2	0. 1	5. 3	14. 2	28
3	0. 3	5.20	14.17	27
4	0. 5	5.38	14.32	26
5	0. 8	5.55	14.47	25
6	0.12	6.13	15. 1	24
7	0.16	8.31	15.15	23
8	0.21	6.49	15.28	22
9	0.26	7. 8	15.41	21
10	0.33	7.26	15.54	20
11	0.39	7.45	16. 6	19
12	0.47	8. 4	16.17	18
13	0.55	8.22	16.28	17
14	1. 3	8.41	16.38	16
15	1.12	9. 0	16.48	15
16	1.22	9.19	16.57	14
17	1.32	9.38	17. 5	13
18	1.43	9.56	17.13	12
19	1.54	10.15	17.21	11
20	2. 6	10.34	17.27	10
21	2.19	10.52	17.34	9
22	2.32	11.11	17.39	8
23	2.45	11.29	17.44	7
24	2.59	11.47	17.48	6
25	3.13	12. 5	17.52	5
26	3.28	12.22	17.55	4
27	3.43	12.40	17.57	3
28	3.58	12.57	17.59	2
29	4.14	13.14	18. 0	1
30	4.30	13.30	18. 0	0
	Sig. 11. / Sig. 5.	Sig. 10. / Sig. 4.	Sig. 9. / Sig. 3.	Dist. ☽ à ☉

Lunæ Tabula Latitudinis veræ ac Reductionis à propria Orbita ad Eclipticam, in Syzygias.

Arg Lat.	Sig. 0. Bor. / Sig. 6. Aust. Latitud.	Sub. / Sub. Red.	Sig. 1. Bor / Sig. 7. Aust. Latitud.	Sub. / Sub. Red.	Sig. 2. Bor. / Sig. 8. Aust. Latitud.	Sub. / Sub Red.	
0	0. ′. ″	′. ″	0. ′. ″	′. ″	0. ′. ″	′. ″	0
0	0. 0. 0	0. 0	2.29.51	5.40	4.19.44	5.41	30
1	0. 5.14	0.14	2.34.22	5.47	4.22.18	5.34	29
2	0.10.27	0.27	2.38.50	5.53	4.24.49	5.26	28
3	0.15.41	0.41	2.43.15	5.59	4.27.14	5.18	27
4	0.20.54	0.55	2.47.37	6. 4	4.29.34	5.10	26
5	0.26. 7	1. 8	2.51.56	6. 9	4.31.50	5. 2	25
6	0.31.19	1.22	2.56.11	6.14	4.34. 0	4.53	24
7	0.36.31	1.35	3. 0.24	6.18	4.36. 6	4.43	23
8	0.41.42	1.48	3. 4.33	6.21	4.38. 6	4.34	22
9	0.46.52	2. 1	3. 8.39	6.24	4.40. 2	4.23	21
10	0.52. 2	2.14	3.12.42	6.27	4.41.52	4.13	20
11	0.57.10	2.27	3.16.41	6.29	4.43.37	4. 2	19
12	1. 2.18	2.40	3.20.36	6.31	4.45.17	3.51	18
13	1. 7.24	2.52	3.24.28	6.32	4.46.52	3.40	17
14	1.12.29	3. 4	3.28.16	6.33	4.48.21	3.29	16
15	1.17.33	3.16	3.32. 0	6.33	4.49.45	3.17	15
16	1.22.36	3.28	3.35.40	6.33	4.51. 4	3. 5	14
17	1.27.37	3.40	3.39.17	6.32	4.52.18	2.53	13
18	1.32.36	3.51	3.42.49	6.31	4.53.26	2.40	12
19	1.37.34	4. 2	3.46.17	6.29	4.54.28	2.28	11
20	1.42.29	4.12	3.49.42	6.27	4.55.26	2.15	10
21	1.47.23	4.23	3.53. 2	6.25	4.56.18	2. 2	9
22	1.52.16	4.33	3.56.17	6.22	4.57. 4	1.49	8
23	1.57. 6	4.43	3.59.29	6.18	4.57.45	1.35	7
24	2. 1.54	4.52	4. 2.36	6.14	4.58.21	1.22	6
25	2. 6.39	5. 1	4. 5.39	6.10	4.58.51	1. 8	5
26	2.11.23	5. 9	4. 8.37	6. 5	4.59.16	0.55	4
27	2.16. 4	5.18	4.11.30	6. 0	4.59.35	0.41	3
28	2.20.42	5.26	4.14.19	5.54	4.59.49	0.27	2
29	2.25.18	5.33	4.17. 4	5.47	4.59.57	0.14	1
30	2.29.51	5.40	4.19.44	5.41	5. 0. 0	0. 0	0
—	Sig. 11. Aust. / Sig. 5. Bor.	Add. / Add	Sig. 10. Aust / Sig. 4. Bor.	Add. / Add.	Sig. 9. Aust. / Sig. 3. Bor	Add. / Add.	Arg. Lat.

Tabula Motuum Horariorum, Semidiametrorum ac Luminarium Parallaxarum.

Anomal. media. s. o.	Hor ☉ Verus. ' ''	Horar. ☽ Pri. Æq ' ''	Horar. ☽ in Syzy. ' ''	Semid ☉ Verus. ' ''	Semid. ☽ ho. in Sy. ' ''	Paral. ☽ ho. in Sv. ' ''	Anomalia media. s. o.	Dist. ☉ à Vert. o.	Parall. ☉ ''
0. 0	2.23	30. 5	29.33	15.39	14.19	52.59	12. 0	0	0
0. 6	2.23	30. 6	29.34	15.39	14.19	53. 0	11.24	3	1
0.12	2.23	30. 9	29.37	15.39	14.20	53. 3	11.18	6	2
0.18	2.23	30.13	29.43	15.39	14.22	53. 8	11.12	9	2
0.24	2.23	30.19	29.51	15.40	14.24	53.15	11. 6	12	3
1. 0	2.23	30.28	30. 3	15.41	14.26	53.24	11. 0	15	4
1. 6	2.24	30.38	30.17	15.42	14.29	53.35	10.24	18	5
1.12	2.24	30.49	30.31	15.43	14.33	53.48	10.18	21	5
1.18	2.24	31. 1	30.47	15.44	14.37	54. 3	10.12	24	6
1.24	2.25	31.15	31. 6	15.45	14.41	54.20	10. 6	27	7
2. 0	2.25	31.30	31.27	15.47	14.46	54.38	10. 0	30	7
2. 6	2.26	31.46	31.50	15.48	14.52	54.58	9.24	33	8
2.12	2.26	32. 3	32.14	15.50	14.57	55.20	9.18	36	9
2.18	2.27	32.21	32.39	15.51	15. 3	55.42	9.12	39	9
2.24	2.27	32.39	33. 4	15.53	15.10	56. 6	9. 6	42	10
3. 0	2.28	32.56	33.29	15.55	15.17	56.31	9. 0	45	11
3. 6	2.28	33.14	33.55	15.56	15.23	56.56	8.24	48	11
3.12	2.29	33.32	34.22	15.58	15.30	57.22	8.18	51	12
3.18	2.29	33.50	34.50	16. 0	15.37	57.48	8.12	54	12
3.24	2.30	34. 7	35.17	16. 2	15.44	58.13	8. 6	57	13
4. 0	2.30	34.23	35.42	16. 3	15.51	58.38	8. 0	60	13
4. 6	2.31	34.38	36. 5	16. 5	15.57	59. 2	7.24	63	13
4.12	2.31	34.52	36.26	16. 6	16. 4	59.25	7.18	66	14
4.18	2.32	35. 4	36.46	16. 7	16. 9	59.46	7.12	69	14
4.24	2.32	35.15	37. 5	16. 8	16.14	60. 5	7. 6	72	14
5. 0	2.32	35.25	37.23	16. 9	16.19	60.22	7. 0	75	14
5. 6	2.33	35.34	37.38	16.10	16.23	60.36	6.24	78	15
5.12	2.33	35.40	37.51	16.11	16.26	60.48	6.18	81	15
5.18	2.33	35.44	38. 0	16.11	16.28	60.56	6.12	84	15
5.24	2.33	35.47	38. 5	16.12	16.29	61. 1	6. 6	87	15
6. 0	2.33	35.48	38. 6	16.12	16.30	61. 2	6. 0	90	15

Tabula Motus Medij
LUNÆ à SOLE.

Anno chr. ☽ p 95

Ann. Chr. ~~Cur.~~ intrans	Mot. ☽ à ☉ s ° ′ ″
1.	6.24.31.49
1501	4.10.26.49
1581	10. 4. 5.45
1601	2.17.30.29
1621	7. 0.55.13
1641	11.14.19.57
1661	3.27.44.41
1681	8.11. 9.25
1701	0.24.34. 9
1721	5. 7.58.53
1741	9.21 23.37
1761	2. 4.48.21
1781	6.18.13. 5
1801	11. 1.37.49
1901	9 8.41.29
2001	7.15.45 9

An-nis.	Mot. ☽ à ☉ s ° ′ ″
20	4.13.24.44
40	8.26.49.28
60	1.10.14.12
80	5.23.38.56
100	10. 7. 3.40
200	8.14. 7.20
300	6.21.11. 0
400	4.28.14.40
500	3. 5.18.20
600	1.12.22. 0
700	11.19 25.40
800	9.26.29.20
900	8. 3.33. 0
1000	6.10 36.40
2000	0.21.13.20
3000	7. 1 50. 0
4000	1.12.26.40
5000	7.23. 3 20
6000	2. 3.40. 0

An-nis. plenis	Mot. ☽ à ☉ s ° ′ ″
1	4. 9.37.23
2	8.19.14.45
3	0.28.52. 7
4	5.20.40.57
5	10. 0.18.20
6	2. 9.55 42
7	6.19 33. 4
8	11.11.21.54
9	3.20.59.17
10	8. 0.36.39
11	0.10.14. 1
12	5. 2. 2.50
13	9.11.40.13
14	1 21.17 35
15	6. 0 54.57
16	10.22.43.47
17	3. 2.21.10
18	7.11.58.32
19	11.21.35.54
20	4.13.24.44

Mens. A.Cõ	Mot. ☽ à ☉ s ° ′ ″
Janua.	0. 0. 0. 0
Febr.	0.17.54.47
Mart.	11.29.15.14
April.	0.17.10. 2
Maij.	0 22.53.22
Junij.	1.10.48.10
Julij.	1.16.31.31
Aug.	2. 4.26.18
Sept.	2.22.21. 6
Octo.	2.28. 4.27
Nov.	3.15.59.14
Decẽ.	3.21.42.34

Dies. plenj	Mot. ☽ à ☉ s ° ′ ″
1	0.12.11.27
2	0.24 22 53
3	1. 6.34.20
4	1.18.45.47
5	2. 0.57.13
6	2.13. 8.40
7	2.25.20. 7
8	3. 7.31.33
9	3.19.43. 0
10	4. 1.54.27
11	4.14. 5.53
12	4.26.17.20
13	5. 8.28.47
14	5.20.40.13
15	6. 2.51.40
16	6.15. 3. 7
17	6.27 14.33
18	7. 9.26. 0
19	7.21 37.27
20	8. 3.48.53
21	8.16. 0.20
22	8.28.11 47
23	9.10.23.13
24	9.22.34.40
25	10. 4.46. 7
26	10.16.57.33
27	10.29. 9. 0
28	11.11.20.27
29	11.23.31.53
30	0. 5.43.20
31	0.17.54.47
32	1. 0. 6.13

Hor.	Mot ☽ à ☉ ° ′ ″	H.	mot. ☽ à ☉ ° ′ ″
′	′ ″ ‴	′.	′ ″ ‴
″	″ ‴ iv	″.	″ ‴ iv
1	0.30.29	31	15.44 47
2	1. 0.57	32	16.15. 16
3	1.31.26	33	16.45. 44
4	2. 1.54	34	17.16. 13
5	2.32.23	35	17.46. 42
6	3. 2.52	36	18.17. 10
7	3.33.20	37	18.47. 39
8	4 3.49	38	19.18. 7
9	4.34.18	39	19.48. 36
10	5. 4.46	40	20.19. 5
11	5 35.15	41	20.49. 33
12	6. 5.43	42	21.20. 2
13	6 36.12	43	21.50. 31
14	7. 6 41	44	22.20. 59
15	7.37. 9	45	22.51. 28
16	8. 7.38	46	23.21. 56
17	8.38. 6	47	23.52. 25
18	9. 8.35	48	24.22. 54
19	9.39 4	49	24.53. 22
20	10. 9.32	50	25.23. 51
21	10.40. 1	51	25.54. 19
22	11 10.30	52	26.24. 48
23	11.40.58	53	26.55. 17
24	12.11.27	54	27.25. 45
25	12.41.55	55	27.56. 14
26	13.12.24	56	28.26. 43
27	13.42.53	57	28.57. 11
28	14.13.21	58	29.27. 40
29	14 43 50	59	29.58. 8
30	15.14.19	60	30.28. 37

In Anno Bissextili post Februarium adde unum diem & unius diei motum.

SATURNI

Tabula Motus Medii ab Aphelio.

An Chr. Current.	Anomalia ♄ s ° ' "
1	6· 8·34·18
1501	5·10·11·48
1581	1·27·53· 0
1601	10· 2·18 18
1621	6· 6·43·36
1641	2·11· 8·54
1661	10·15·34·12
1681	6·19·59·30
1701	2·24 24·48
1721	10·28·50· 6
1741	7 3·15·24
1761	3· 7·40·42
1781	11·12· 6· 0
1801	7·16·31·18
1901	0· 8·37·48
2001	5· 0·44·18
Annis.	Mot. anomal.
20	8· 4·25·18
40	4· 8·50·36
60	0·13·15·54
80	8·17·41·12
100	4·22· 6·30
200	9·14·13· 0
300	2· 6·19·30
400	6 28·26· 0
500	11·20·32·30
600	4·12·39· 0
700	9· 4·45·30
800	1·26 52· 0
900	6·18·58·30
1000	11·11· 5· 0
2000	10·22·10· 0
3000	10· 3·15· 0
4000	9·14·20· 0
5000	8·25·25· 0
6000	8· 6·30· 0

Annis	Mot. Anom. s ° ' "
1	0·12·12·46
2	0·24 25·32
3	1· 6·38·17
4	1·18·53· 4
5	2· 1· 5·49
6	2 13·18·35
7	2·25·31·21
8	3 7·46· 7
9	3·19 58·53
10	4· 2·11·39
11	4·14·24·25
12	4·26·39·11
13	5· 8·51·57
14	5·21· 4·42
15	6· 3·17·28
16	6·15 32·14
17	6·27·45· 0
18	7· 9·57·46
19	7·22·10·32
20	8· 4·25·18
Mens. A. Com	Mot. anom. ° ' "
Janua.	0· 0· 0
Febr.	1· 2·14
Mart.	1·58·27
April.	3· 0·41
Maij.	4· 0·55
Junij.	5· 3· 9
Julij.	6· 3·22
Aug.	7· 5 36
Sept.	8· 7 50
Octo.	9· 8· 4
Novē.	10·10·18
Decē.	11·10·32

In Anno Bissextili, post Februarium, adde unum diem & unius diei motum.

Dies	Mot. Anom. ° ' "
1	0· 2· 0
2	0· 4· 1
3	0· 6· 1
4	0. 8· 2
5	0·10· 2
6	0 12· 3
7	0·14· 3
8	0·16· 4
9	0·18· 4
10	0·20· 5
11	0·22· 5
12	0·24· 5
13	0·26· 6
14	0·28· 6
15	0·30· 7
16	0·32· 7
17	0·34· 8
18	0·36· 8
19	0·38· 9
20	0·40· 9
21	0·42·10
22	0·44·10
23	0·46·10
24	0·48·11
25	0·50 11
26	0·52·12
27	0·54·12
28	0·56·13
29	0·58·13
30	1· 0·14
31	1· 2·14
32	1· 4·15

H	Motus Anom.	H.	Motus Anom.
'	' " / " '''	'	' " / " '''
1	0· 5	31	2·36
2	0·10	32	2·41
3	0·15	33	2·46
4	0·20	34	2·51
5	0·25	35	2·56
6	0·30	36	3· 1
7	0·35	37	3· 6
8	0·40	38	3·11
9	0·45	39	3·16
10	0·50	40	3·21
11	0·55	41	3·26
12	1· 0	42	3·31
13	1· 5	43	3·36
14	1·10	44	3·41
15	1·15	45	3·46
16	1 20	46	3·51
17	1·25	47	3·56
18	1·30	48	4· 1
19	1·35	49	4· 6
20	1·40	50	4·11
21	1·45	51	4·16
22	1·50	52	4·21
23	1 55	53	4·26
24	2· 0	54	4·31
25	2· 5	55	4·36
26	2·10	56	4·41
27	2·16	57	4·46
28	2·21	58	4·51
29	2·26	59	4·56
30	2·31	60	5· 1

	s ° ' "
Long. Aph. ♄ à 1 ✱ ♈.	7· 28· 30· 0
Long. ☊· ♄ à 1 ✱ ♈.	2. 22· 30· 0
Incli. Orb. ♄	2· 30. 0
Dist. med. ♄ à ☉	953800
Eccentricitas.	54700

SATURNI
Tabula Loci Heliocentrici.

Anom med	Sig. 0. Long. ♄ à 1 * ♈.	Sig. 0. Inc. Bor.	Sig. 0. Dis. à ☉ Cur.	Sig. 1. Long. ♄ à 1 * ♈.	Sig. 1. Inc. Au.	Sig. 1. Dis. à ☉ Cur.
0	s ° ′ ″	° ′ ″	Logarithm.	s ° ′ ″	° ′ ″	Logarithm
0	7.28.31.13	1. 1. 0	6.003608	8.25.24.16	0. 7.36	6.000823
1	7.29.24.46	0.58.51	6.003609	8.26.18.32	0. 9.58	6.000632
2	8. 0.18.19	0.56.42	6.003605	8.27.12.50	0.12.20	6.000435
3	8. 1.11.52	0.54.31	6.003593	8.28. 7.11	0.14.42	6.000232
4	8. 2. 5.24	0.52.20	6.003575	8.29. 1.36	0.17. 4	6.000022
5	8. 2.58.58	0.50. 9	6.003550	8.29.56. 3	0.19.25	5.999806
6	8. 3.52.32	0.47.56	6.003519	9. 0.50.34	0.21.47	5.999585
7	8. 4.46. 6	0.45.43	6.003481	9. 1.45. 8	0.24. 8	5.999358
8	8. 5.39.41	0.43.29	6.003435	9. 2.39.46	0.26.29	5.999125
9	8. 6.33.16	0.41.14	6.003386	9. 3.34.27	0.28.50	5.998887
10	8. 7.26.52	0.38.59	6.003328	9. 4.29.11	0.31.10	5.998642
11	8. 8.20.30	0.36.43	6.003263	9. 5.24. 0	0.33.30	5.998391
12	8. 9.14. 8	0.34.26	6.003193	9. 6.18.53	0.35.50	5.998135
13	8.10. 7.48	0.32. 9	6.003115	9. 7.13.49	0.38.10	5.697874
14	8.11. 1.28	0.29.52	6.003032	9. 8. 8.49	0.40.29	5.997607
15	8.11.55.10	0.27.34	6.002942	9. 9. 3.53	0.42.47	5.997334
16	8.12.48.53	0.25.15	6.002845	9. 9.59. 2	0.45. 5	5.997056
17	8.13.42.37	0.22.56	6.002743	9.10.54.15	0.47.23	5.996772
18	8.14.36.24	0.20.37	6.002633	9.11.49.32	0.49.40	5.996484
19	8.15.30.13	0.18.17	6.002517	9.12.44.54	0.51.57	5.996189
20	8.16.24. 2	0.15.57	6.002395	9.13.40.20	0.54.12	5.995890
21	8.17.17.53	0.13.37	6.002267	9.14.35.51	0.56.27	5.995585
22	8.18.11.47	0.11.16	6.002131	9.15.31.26	0.58.42	5.995277
23	8.19. 5.43	0. 8.55	6.001990	9.16.27. 6	1. 0.56	5.994962
24	8.19.59.40	0. 6.34	6.001842	9.17.22.52	1. 3. 9	5.994643
25	8.20.53.40	0. 4.12	6.001688	9.18.18.42	1. 5.21	5.994319
26	8.21.47.42	0. 1.51	6.001527	9.19.14.38	1. 7.32	5.993989
27	8.22.41.47	Aust. 31	6.001361	9.20.10.39	1. 9.42	5.993656
28	8.23.35.54	0. 2.53	6.001188	9.21. 6.43	1.11.52	5.993317
29	8.24.30. 4	0. 5.15	6.001009	9.22. 2.54	1.14. 1	5.992973
30	8.25.24.16	0. 7.36	6.000823	9.22.59.10	1.16. 8	5.992625

SATURNI
Tabula Loci Heliocentrici.

Anom med.	Sig. 2.			Sig. 3.		
	Long. ♄ à 1 ✶ ♈	Inc. Au.	Dis. à ☉ Cur	Long. ♄ à 1 ✶ ♈	Inc. Au.	Dis. à ☉ Cur
0	s ° ′ ″	° ′ ″	Logarithm.	s ° ′ ″	° ′ ″	Logarithm.
0	9.22.59.10	1.16. 8	5.992625	10.21.54.42	2. 9. 9	5.980576
1	9.23.55.32	1.18.15	5.992273	10.22.54.18	2.10.27	5.980139
2	9.24.52. 0	1.20.20	5.991917	10.23.54. 1	2.11.43	5.979700
3	9.25.48.32	1.22.25	5.991557	10.24.53.51	2.12.57	5.979260
4	9.26.45.10	1.24.28	5.991192	10.25.53.49	2.14. 8	5.978819
5	9.27.41.55	1.26.30	5.990824	10.26.53.54	2.15.17	5.978378
6	9.28.38.45	1.28.31	5.990451	10.27.54. 6	2.16.24	5.977936
7	9.29.35.41	1.30.30	5.990074	10.28.54.25	2.17.29	5.977494
8	10. 0.32.42	1.32.29	5.989694	10.29.54.52	2.18.31	5.977051
9	10. 1.29.50	1.34.26	5.989310	11. 0.55.27	2.19.30	5.976609
10	10. 2.27. 4	1.36.21	5.988922	11. 1.56. 8	2.20.27	5.976166
11	10. 3.24.24	1.38.16	5.988532	11. 2.56.58	2.21.22	5.975724
12	10. 4.21.50	1.40. 8	5.988137	11. 3.57.54	2.22.14	5.975282
13	10. 5.19.23	1.42. 0	5.987739	11. 4.58.59	2.23. 3	5.974841
14	10. 6.17. 3	1.43.50	5.987338	11. 6. 0.12	2.23.50	5.974400
15	10. 7.14.48	1.45.38	5.986934	11. 7. 1.31	2.24.34	5.973960
16	10. 8.12.40	1.47.24	5.986527	11. 8. 2.58	2.25.16	5.973520
17	10. 9.10.38	1.49. 9	5.986117	11. 9. 4.32	2.25.54	5.973083
18	10.10. 8.44	1.50.53	5.985704	11.10. 6.13	2.26.30	5.972647
19	10.11. 6.56	1.52.35	5.985288	11.11. 8. 2	2.27. 4	5.972211
20	10.12. 5.14	1.54.14	5.984870	11.12.10. 0	2.27.34	5.971777
21	10.13. 3.40	1.55.53	5.984450	11.13.12. 3	2.28. 2	5.971345
22	10.14. 2.13	1.57.29	5.984027	11.14.14.15	2.28.27	5.970915
23	10.15. 0.52	1.59. 3	5.983603	11.15.16.33	2.28.49	5.970487
24	10.15.59.38	2. 0.36	5.983176	11.16.18.59	2.29. 8	5.970060
25	10.16.58.30	2. 2. 6	5.982747	11.17.21.34	2.29.24	5.969637
26	10.17.57.29	2. 3.35	5.982315	11.18.24.14	2.29.37	5.969216
27	10.18.56.37	2. 5. 2	5.981883	11.19.27. 3	2.29.47	5.968798
28	10.19.55.50	2. 6.26	5.981448	11.20.29.57	2.29.55	5.968382
29	10.20.55.12	2. 7.48	5.981013	11.21.33. 1	2.29.59	5.967970
30	10.21.54.42	2. 9. 9	5.980576	11.22.36.10	2.30. 0	5.967559

SATURNI
Tabula Loci Heliocentrici.

Anom med.	Sig. 4.			Sig. 5.		
	Lon. ♄ à 1 ✶ ♈	Inc. Au.	Dis. à ☉ Cur	Lon. ♄ à 1 ✶ ♈	Inc. Au.	Dis. à ☉ Cur
o	s o ′ ″	o ′ ″	Logarithm.	s o ′ ″	o ′ ″	Logarithm.
	11.22.36.10	2.30. 0	5.967559	0.25. 1.23	2. 6.30	5.957445
1	11.23.39.27	2.29.58	5.967153	0.26. 7.40	2. 4.55	5.957203
2	11.24.42.52	2.29.53	5.966750	0.27.14. 0	2. 3.18	5.956969
3	11.25.46.22	2.29.45	5.966350	0.28.20.25	2. 1.37	5.956742
4	11.26.50. 0	2.29.34	5.965954	0.29.26.53	1.59.54	5.956523
5	11.27.53.45	2.29.20	5.965562	1. 0.33.26	1.58. 8	5.956312
6	11.28.57.38	2.29. 3	5.965175	1. 1.40. 3	1.56.20	5.956107
7	0. 0. 1.37	2.28.43	5.964791	1. 2.46.44	1.54.28	5.955912
8	0. 1. 5.42	2.28.19	5.964412	1. 3.53.27	1.52.34	5.955724
9	0. 2. 9.54	2.27.52	5.964036	1. 5. 0.15	1.50.37	5.955544
10	0. 3.14.13	2.27.23	5.963666	1. 6. 7. 5	1.48.38	5.955373
11	0. 4.18.37	2.26.50	5.963300	1. 7.13.58	1.46.36	5.955210
12	0. 5.23.10	2.26.14	5.962939	1. 8.20.55	1.44.31	5.955055
13	0. 6.27.48	2.25.34	5.962584	1. 9.27.54	1.42.24	5.954910
14	0. 7.32.32	2.24.52	5.962233	1.10.34.57	1.40.15	5.954771
15	0. 8.37.23	2.24. 6	5.961888	1.11.42. 1	1.38. 3	5.954641
16	0. 9.42.20	2.23.18	5.961549	1.12.49. 8	1.35.49	5.954520
17	0.10.47.23	2.22.26	5.961214	1.13.56.16	1.33.32	5.954408
18	0.11.52.32	2.21.31	5.960886	1.15. 3.26	1.31.14	5.954304
19	0.12.57.46	2.20.33	5.960564	1.16.10.38	1.28.53	5.954209
20	0.14. 3. 6	2.19.31	5.960248	1.17.17.53	1.26.30	5.954122
21	0.15. 8.33	2.18.27	5.959938	1.18.25. 9	1.24. 5	5.954044
22	0.16.14. 4	2.17.20	5.959634	1.19.32.27	1.21.39	5.953974
23	0.17.19.42	2.16. 9	5.959337	1.20.39.45	1.19.10	5.953914
24	0.18.25.24	2.14.55	5.959046	1.21.47. 4	1.16.39	5.953862
25	0.19.31.11	2.13.39	5.958762	1.22.54.24	1.14. 7	5.953819
26	0.20.37. 3	2.12.19	5.958484	1.24. 1.45	1.11.32	5.953786
27	0.21.43. 1	2.10.56	5.958214	1.25. 9. 7	1. 8.57	5.953761
28	0.22.49. 4	2. 9.30	5.957951	1.26.16.28	1. 6.19	5.953745
29	0.23.55.11	2. 8. 2	5.957695	1.27.23.50	1. 3.40	5.953738
30	0.25. 1.23	2. 6.30	5.957445	1.28.31.13	1. 1. 0	5.953740

SATURNI
Tabula Loci Heliocentrici.

Anom med.	Sig. 6.			Sig. 7.		
	Long. ♄ à 1 ✱ ♈	Inc. Au.	Dis. à ☉ Cur	Long. ♄ à 1 ✱ ♈	Inc. Bor.	Dis. à ☉ Cur
°	s ° ′ ″	° ′ ″	Logarithm.	s ° ′ ″	° ′ ″	Logarithm.
0	1.28.31.13	1. 1. 0	5.953740	3. 1.59.34	0.24.54	5.957728
1	1.29.38.36	0.58.18	5.953750	3. 3. 5.40	0.27.36	5.957982
2	2. 0.45.57	0.55.35	5.953769	3. 4.11.42	0.30.25	5.958242
3	2. 1.53.18	0.52.50	5.953797	3. 5.17.40	0.33.14	5.958509
4	2. 3. 0.39	0.50. 4	5.953834	3. 6.23.32	0.36. 2	5.958782
5	2. 4. 7.59	0.47.18	5.953879	3. 7.29.19	0.38.49	5.959062
6	2. 5.15.18	0.44.30	5.953934	3. 8.35. 0	0.41.35	5.959349
7	2. 6.22.35	0.41.41	5.953997	3. 9.40.37	0.44.19	5.959642
8	2. 7.29.52	0.38.51	5.954069	3.10.46. 9	0.47. 3	5.959940
9	2. 8.37. 8	0.36. 0	5.954150	3.11.51.35	0.49.45	5.960245
10	2. 9.44.21	0.33. 9	5.954239	3.12.56.57	0.52.26	5.960555
11	2.10.51.34	0.30.17	5.954337	3.14. 2.11	0.55. 6	5.960871
12	2.11.58.43	0.27.24	5.954443	3.15. 7.20	0.57.44	5.961193
13	2.13. 5.51	0.24.31	5.954558	3.16.12.24	1. 0.20	5.961520
14	2.14.12.57	0.21.38	5.954680	3.17.17.21	1. 2.55	5.961853
15	1.15.20. 0	0.18.44	5.954812	3.18.22.12	1. 5.29	5.962191
16	2.16.27. 1	0.15.49	5.954951	3.19.26.58	1. 8. 1	5.962534
17	2.17.34. 1	0.12.54	5.955099	3.20.31.37	1.10.31	5.962882
18	2.18.40.56	0.10. 0	5.955254	3.21.36.10	1.13. 0	5.963234
19	2.19.47.49	0. 7. 5	5.955418	3.22.40.37	1.15.26	5.963592
20	2.20.54.38	0. 4.10	5.955590	3.23.44.56	1.17.51	5.963954
21	2.22. 1.25	0. 1.15	5.955769	3.24.49.10	1.20.14	5.964320
22	2.23. 8. 8	Bor 1.40	5.955957	3.25.53.17	1.22.35	5.964691
23	2.24.14.47	0. 4.35	5.956153	3.26.57.18	1.24.54	5.965065
24	2.25.21.23	0. 7.29	5.956355	3.28. 1.11	1.27.11	5.965443
25	2.26.27.55	0.10.23	5.956566	3.29. 4.59	1.29.26	5.965825
26	2.27.34.24	0.13.16	5.956784	4. 0. 8.40	1.31.39	5.966211
27	2.28.40.47	0.16. 9	5.957009	4. 1.12.13	1.33.50	5.966600
28	2.29.47. 7	0.19. 2	5.957241	4. 2.15.39	1.35.58	5.966993
29	3. 0.53.23	0.21.54	5.957481	4. 3.19. 0	1.38.15	5.967389
30	3. 1.59.34	0.24.45	5.957728	4. 4.22.12	1.40. 9	5.967789

SATURNI
Tabula Loci Heliocentrici.

Anom. med.	Sig. 8. Long. ♄ à 1 ✱ ♈	Sig. 8. Inc. Bor.	Sig. 8. Dis. à ☉ Cur.	Sig. 9. Long. ♄ à 1 ✱ ♈	Sig. 9. Inc. Bor.	Sig. 9. Dis. à ☉ Cur
°	s ° ′ ″	° ′ ″	Logarithm.	s ° ′ ″	° ′ ″	Logarithm.
0	4. 4.22.12	1.40. 9	5.967789	5. 5. 2.56	2.23. 6	5.980507
1	4. 5.25.18	1.42.11	5.968191	5. 6. 2.27	2.23.52	5.980933
2	4. 6.28.18	1.44.11	5.968595	5. 7. 1.50	2.24.34	5.981358
3	4. 7.31. 9	1.46. 8	5.969003	5. 8. 1. 5	2.25.14	5.981782
4	4. 8.33.54	1.48. 3	5.969412	5. 9. 0.14	2.25.52	5.982205
5	4. 9.36.31	1.49.56	5.969825	5. 9.59.15	2.26.27	5.982627
6	4.10.39. 2	1.51.46	5.970240	5.10.58.10	2.26.59	5.683046
7	4.11.41.25	1.53.34	5.970657	5.11.56.58	2.27.28	5.983463
8	4.12.43.40	1.55.19	5.971076	5.12.55.40	2.27.55	5.983879
9	4.13.45.50	1.57. 2	5.971496	5.13.54.15	2.28.19	5.984293
10	4.14.47.51	1.58.42	5.971918	5.14.52.43	2.28.41	5.984704
11	4.15.49.46	2. 0.20	5.972343	5.15.51. 4	2.29. 0	5.985113
12	4.16.51.33	2. 1.56	5.972768	5.16.49.19	2.29.16	5.985520
13	4.17.53.12	2. 3.29	5.973194	5.17.47.28	2.29.30	5.985925
14	4·18.54.44	2. 4.59	5.973621	5.18.45.29	2.29.41	5.986327
15	4.19.56.10	2. 6.27	5.974050	5.19.43.25	2.29.49	5.986726
16	4.20.57.27	2. 7.52	5.974480	5.20.41.13	2.29.56	5.987123
17	4.21.58.38	2. 9.14	5.974910	5.21.38.56	2.29.59	5.987517
18	4.22.59.42	3.10.34	5.975341	5.22.36.32	2.30. 0	5.987907
19	4.24. 0.38	2.11.51	5.975771	5.23.34. 3	2.29.58	5.988296
20	4.25. 1.27	2.13. 6	5.976203	5.24.31.36	2.29.54	5.988680
21	4.26. 2. 8	2.14.18	5.976635	5.25.28.44	2.29.48	5.989062
22	4.27. 2.42	2.15.27	5.977067	5.26.25.57	2.29.39	5.989439
23	4.28. 3. 9	2.16.34	5.977498	5.27.23. 2	2.29.27	5.989814
24	4.29. 3.28	2.17.38	5.977930	5.28.20. 1	2.29.13	5.990186
25	5. 0. 3.41	2.18.39	5.978361	5.29.16.56	2.28.57	5.990553
26	5. 1. 3.46	2.19.38	5.978792	6. 0.13.45	2.28.38	5.990917
27	5. 2. 3.45	2.20.34	5.979222	6. 1.10.27	2.28.17	5.991278
28	5. 3. 3.35	2.21.27	5.979651	6. 2. 7. 4	2.27.54	5.991634
29	5. 4. 3.19	2.22.18	5.980080	6. 3. 3.36	2.27.28	5.991986
30	5. 5. 2.56	2.23. 6	5.980507	6. 4. 0. 2	2.27. 0	5.992335

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Tabula Loci Heliocentrici

Anom med.	Sig. 10. Long. ♄ à 1 ✳ ♈	Sig. 10. Inc. Bor.	Sig. 10. Dis. à ☉ Cur.	Sig. 11 Long. ♄ à 1 ✳ ♈	Sig. 11 Inc. Bor.	Sig. 11 Dis. à ☉ Cur.
°	s ° ′ ″	° ′ ″	Logarithm	s ° ′ ″	° ′ ″	Logarithm.
0	6. 4. 0. 2	2.27. 0	5.992335	7. 1.37.10	1.56.24	6.000575
1	6. 4.56.23	2.26.29	5.992680	7. 2.31.26	1.54.54	6.000767
2	6. 5.52.39	2.25.56	5.993021	7. 3.25.39	1.53.22	6.000951
3	6. 6.48.48	2.25.21	5.993357	7. 4.19.50	1.51.48	6.001131
4	6. 7.44.53	2.24.44	5.993688	7. 5.13.58	1.50.13	6.001304
5	6. 8.40.54	2.24. 4	5.994016	7. 6. 8. 4	1.48.36	6.001472
6	6. 9.36.48	2.23.22	5.994338	7. 7. 2. 7	1.46.57	6.001632
7	6.10.32.39	2.22.38	5.994656	7. 7.56. 7	1.45.17	6.001787
8	6.11.28.24	2.21.52	5.994970	7. 8.50. 6	1.43.36	6.001936
9	6.12.24. 4	2.21. 3	5.995278	7. 9.44. 3	1.41.53	6.002079
10	6.13.19.39	2.20.13	5.995583	7.10.37.57	1.40. 9	6.002216
11	6.14.15. 9	2.19.20	5.995882	7.11.31.49	1.38.23	6.002345
12	6.15.10.36	2.18.25	5.996177	7.12.25.40	1.36.36	6.002470
13	6.16. 5.58	2.17.28	5.996466	7.13.19.28	1.34.47	6.002588
14	6.17. 1.16	2.16.29	5.996751	7.14.13.14	1.32.58	6.002698
15	6.17.56.29	2.15.28	5.997031	7.15. 7. 0	1.31. 7	6.002803
16	6.18.51.38	2.14.25	5.997305	7.16. 0.44	1.29.14	6.002902
17	6.19.46.43	2.13.20	5.997574	7.16.54.26	1.27.20	6.002994
18	6.20.41.43	2.12.13	5.997838	7.17.48. 8	1.25.25	6.003081
19	6.21.36.40	2.11. 4	5.998096	7.18.41.48	1.23.29	6.003160
20	6.22.31.34	2. 9.53	5.998350	7.19.35.27	1.21.32	6.003234
21	6.23.26.23	2. 8.41	5.998598	7.20.29. 4	1.19.34	6.003301
22	6.24.21. 8	2. 7.26	5.998840	7.21.22.41	1.17.34	6.003360
23	6.25.15.50	2. 6.10	5.999076	7.22.16.17	1.15.33	6.003414
24	6.26.10.29	2. 4.51	5.999308	7.23. 9.52	1.13.31	6.003462
25	6.27. 5. 4	2. 3.31	5.999533	7.24. 3.26	1.11.29	6.003502
26	6.27.59.34	2. 2. 9	5.999753	7.24.57. 0	1. 9.25	6.003536
27	6.28.54. 3	2. 0.46	5.999968	7.25.50.33	1. 7.20	6.003565
28	6.29.48.28	1.59.20	6.000176	7.26.44. 7	1. 5.14	6.003585
29	7. 0.42.50	1.57.53	6.000379	7.27.37.40	1. 3. 7	6.003600
30	7. 1.37.10	1.56.24	6.000575	7.28.31.13	1. 1. 0	6.003608

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Tabula Motus Medii ab Aphelio.

An Chr. Current.	Anomalia ♃ s ° ′ ″
1	0·13·54·30
1501	5·28.17· 0
1581	2.26·15· 0
1601	11· 3·14 30
1621	7·10·14. 0
1641	3·17·13·30
1661	11·24·13· 0
1681	8· 1·12·30
1701	4· 8 12· 0
1721	0·15·11·30
1741	8 22·11 ·0
1761	4·29·10·30
1781	1· 6.10. 0
1801	9·13· 9·30
1901	2·18· 7. 0
2001	7·23· 4·30
Annis.	Mot.anomal.
20	8. 6·59·30
40	4·13·59· 0
60	0·20·58·30
80	8.27 58· 0
100	5· 4 57·30
200	10· 9·55· 0
300	3 14·52·30
400	8 19·50. 0
500	1·24·47·30
600	6·29·45· 0
700	0· 4·42·30
800	5· 9 40· 0
900	10·14·37·30
1000	3·19·35· 0
2000	7· 9·10· 0
3000	10 28·45· 0
4000	2·18·20. 0
5000	6. 7·55· 0
6000	9·27·30· 0

Annis	Mot. Anom. s ° ′ ″
1	1· 0·19·44
2	2· 0 39·27
3	3 · 0·59.11
4	4· 1·23·54
5	5· 1·43·38
6	6 2. 3·21
7	7· 2 23· 5
8	8 2·47·48
9	9· 3 7·32
10	10·3·27·15
11	11·3·46·59
12	0· 4·11·42
13	1. 4·31 26
14	2· 4·51· 9
15	3· 5·10·53
16	4· 5 35·36
17	5· 5·55·20
18	6· 6.15· 3
19	7· 6·34·47
20	8· 6·59·30
Menſ. A Com	Mot. anom. ° ′ ″
Janua.	0· 0· 0
Febr.	2·34·33
Mart.	4·54· 9
April.	7·28.42
Maij.	9·58.16
Junij.	12·32 49
Julij.	15· 2·23
Aug.	17·36 56
Sept.	20·11 29
Octo.	22.41· 3
Novē	25·15·37
Decē.	27·45·11

In Anno Biſſextili, poſt Februarium, adde unum diem & unius diei motum.

Dies	Mot. Anom. ° ′ ″
1	0· 4·59
2	0· 9·58
3	0.14·57
4	0·19·57
5	0·24·56
6	0 29·55
7	0·34·54
8	0·39·53
9	0·44·52
10	0·49·51
11	0·54·50
12	0 59·50
13	1· 4·49
14	1· 9·48
15	1·14·47
16	1·19 46
17	1·24·45
18	1·29·44
19	1·34·44
20	1·39·43
21	1.44·42
22	1·49·41
23	1·54·40
24	1·59·39
25	2· 4 38
26	2· 9·37
27	2·14·37
28	2·19·36
29	2·24·35
30	2·29·34
31	2·34·33
32	2·39·32

	Motus Anom.
H	′ ″
′	″ ‴
1	0·12
2	0 25
3	0·37
4	0·50
5	1· 2
6	1·15
7	1·27
8	1·40
9	1·52
10	2· 5
11	2·17
12	2·30
13	2·42
14	2·54
15	3· 7
16	3·19
17	3·32
18	3·44
19	3·57
20	4· 9
21	4·22
22	4·34
23	4 47
24	4·59
25	5·12
26	5·24
27	5·37
28	5·49
29	6· 1
30	6·14

	Motus Anom.
H.	′ ″
′	″ ‴
31	6·26
32	6·39
33	6·51
34	7· 4
35	7·16
36	7·29
37	7·41
38	7·54
39	8· 6
40	8·19
41	8·31
42	8·43
43	8·56
44	9· 8
45	9·21
46	9·33
47	9·46
48	9·58
49	10·11
50	10·23
51	10·36
52	10·48
53	11· 1
54	11·13
55	11·26
56	11·38
57	11·50
58	12· 3
59	12·15
60	12·28

	s ° ′ ″
Long. Aph. ♃ à 1 ✱ ♈.	5· 9· 50· 0
Long ☊. ♃ à 1 ✱ ♈.	2. 8· 0· 0
Incli. Orb. ♃	1· 20. 0
Diſt med. ♃ à ☉	520110
Eccentricitas.	25050

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Tabula Loci Heliocentrici.

Anom med.	Sig. 0.			Sig. 1.		
	Long. ♃ à ♈ ✱ ♈	Inc. Bor.	Dis. à ☉ Cur	Long. ♃ à ♈ ✱ ♈	Inc. Bor.	Dis. à ☉ Cur
0	s ° ′ ″	° ′ ″	Logarithm.	s ° ′ ″	° ′ ″	Logarithm.
0	5. 9.50. 2	1.19.58	5.736406	6. 7.13. 4	1. 9.50	5.733980
1	5.10.44.36	1.19.55	5.736403	6. 8. 8.15	1. 9.11	5.733818
2	5.11.39.10	1.19.51	5.736395	6. 9. 3.30	1. 8.32	5.733652
3	5.12.33.44	1.19.45	5.736381	6. 9.58.46	1. 7.52	5.733479
4	5.13.28.18	1.19.38	5.736362	6.10.54. 5	1. 7.10	5.733302
5	5.14.22.53	1.19.30	5.736338	6.11.49.28	1. 6.28	5.733120
6	5.15.17.28	1.19.21	5.736308	6.12.44.53	1. 5.44	5.732934
7	5.16.12. 4	1.19.11	5.736273	6.13.40.20	1. 5. 0	5.732741
8	5.17. 6.40	1.18.59	5.736231	6.14.35.52	1. 4.14	5.732545
9	5.18. 1.17	1.18.47	5.736185	6.15.31.26	1. 3.27	5.732344
10	5.18.55.55	1.18.33	5.736134	6.16.27. 3	1. 2.39	5.732139
11	5.19.50.32	1.18.18	5.736076	6.17.22.43	1. 1.51	5.731928
12	5.20.45.11	1.18. 2	5.736014	6.18.18.26	1. 1. 1	5.731713
13	5.21.39.52	1.17.44	5.735947	6.19.14.14	1. 0.10	5.731492
14	5.22.34.33	1.17.26	5.735873	6.20.10. 4	0.59.18	5.731268
15	5.23.29.15	1.17. 6	5.735795	6.21. 5.58	0.58.25	5.731039
16	5.24.23.59	1.16.45	5.735710	6.22. 1.55	0.57.31	5.730807
17	5.25.18.44	1.16.23	5.735621	6.22.57.56	0.56.36	5.730570
18	5.26.13.30	1.15.59	5.735526	6.23.54. 1	0.55.41	5.730327
19	5.27. 8.18	1.15.35	5.735426	6.24.50. 9	0.54.44	5.730081
20	5.28. 3. 8	1.15. 9	5.735321	6.25.46.22	0.53.46	5.729831
21	5.28.57.59	1.14.42	5.735210	6.26.42.38	0.52.48	5.729576
22	5.29.52.52	1.14.14	5.735094	6.27.38.57	0.51.48	5.729318
23	6. 0.47.46	1.13.45	5.734973	6.28.35.21	0.50.48	5.729055
24	6. 1.42.43	1.13.15	5.734846	6.29.31.50	0.49.46	5.728788
25	6. 2.37.40	1.12.44	5.734714	7. 0.28.23	0.48.44	5.728517
26	6. 3.32.41	1.12.11	5.734577	7. 1.25. 0	0.47.41	5.728243
27	6. 4.27.43	1.11.37	5.734436	7. 2.21.41	0.46.37	5.727965
28	6. 5.42.47	1.11. 2	5.734289	7. 3.18.26	0.45.32	5.727683
29	6. 6.17.55	1.10.27	5.734137	7. 4.15.17	0.44.27	5.727397
30	6. 7.13. 4	1. 9.50	5.733980	7. 5.12.10	0.43.20	5.727106

JOVIS
Tabula Loci Heliocentrici.

Anom med.	Sig. 2.			Sig. 3.		
	Long. ♃ à 1 ✱ ♈	Inc. Bor.	Dis. à ☉ Cur	Long. ♃ à 1 ✱ ♈	Inc. Bor.	Dis. à ☉ Cur
°	s ° ′ ″	° ′ ″	Logarithm.	s ° ′ ″	° ′ ″	Logarithm
0	7. 5.12.10	0.43.20	5.727106	8. 4.19.11	0. 5. 8	5.717101
1	7. 6. 9.10	0.42.13	5.726813	8. 5.18.52	0. 3.45	5.716738
2	7. 7. 6.14	0.41. 5	5.726517	8. 6.18.39	0. 2.22	5.716374
3	7. 8. 3.22	0.39.56	5.726216	8. 7.18.32	0. 0.58	5.716009
4	7. 9. 0.36	0.38.47	5.725912	8. 8.18.32	Au0.26	5.715644
5	7. 9.57.54	0.37.36	5.725607	8. 9.18.37	0. 1.50	5.715278
6	7.10.55.16	0.36.25	5.725297	8.10.18.49	0. 3.14	5.714911
7	7.11.52.45	0.35.14	5.724983	8.11.19. 6	0. 4.38	5.714545
8	7.12.50.17	0.34. 1	5.724667	8.12.19.30	0. 6. 2	5.714177
9	7.13.47.56	0.32.48	5.724348	8.13.20. 0	0. 7.26	5.713809
10	7.14.45.39	0.31.34	5.724026	8.14.20.36	0. 8.50	5.713443
11	7.15.43.28	0.30.20	5.723700	8.15.21.18	0.10.15	5.713076
12	7.16.41.21	0.29. 5	5.723372	8.16.22. 6	0.11.39	5.712710
13	7.17.39.19	0.27.49	5.723043	8.17.23. 1	0.13. 3	5.712342
14	7.18.37.23	0.26.33	5.722709	8.18.24. 2	0.14.27	5.711976
15	7.19.35.32	0.25.16	5.722373	8.19.25. 9	0.15.50	5.711611
16	7.20.33.48	0.23.59	5.722035	8.20.26.22	0.17.14	5.711248
17	7.21.32. 8	0.22.41	5.721696	8.21.27.41	0.18.38	5.710884
18	7.22.30.34	0.21.22	5.721354	8.22.29. 6	0.20. 1	5.710521
19	7.23.29. 6	0.20. 3	5.721009	8.23.30.38	0.21.24	5.710159
20	7.24.27.43	0.18.44	5.720662	8.24.32.15	0.22.47	5.709798
21	7.25.26.26	0.17.24	5.720312	8.25.34. 0	0.24. 9	5.709439
22	7.26.25.14	0.16. 4	5.719962	8.26.35.50	0.25.31	5.709081
23	7.27.24. 9	0.14.43	5.719610	8.27.37.46	0.26.53	5.708725
24	7.28.23. 9	0.13.22	5.719256	8.28.39.48	0.28.14	5.708371
25	7.29.22.14	0.12. 0	5.718900	8.29.41.56	0.29.35	5.708018
26	8. 0.21.26	0.10.39	5.718543	9. 0.44.11	0.30.55	5.707667
27	8. 1.20.43	0. 9.16	5.718184	9. 1.46.31	0.32.15	5.707319
28	8. 2.20. 7	0. 7.54	5.717825	9. 2.48.58	0.33.35	5.706972
29	8. 3.19.36	0. 6.31	5.717463	9. 3.51.30	0.34.54	5.706629
30	8. 4.19.11	0. 5. 8	5.717101	9. 4.54. 9	0.36.12	5.706287

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Tabula Loci Heliocentrici.

Anom med	Sig. 4.			Sig. 5.		
	Long. ♃ à 1 ✱ ♈.	Inc. Au.	Dis. à ☉ Cur	Long. ♃ à 1 ✱ ♈.	Inc. Au.	Dis. á ☉ Cur
o	s o ′ ″	o ′ ″	Logarithm.	s o ′ ″	o ′ ″	Logarithm
0	9. 4.54. 9	0.36.12	5.706287	10. 6.54.58	1. 8.31	5.697786
1	9. 5.56.53	0.37.30	5.705948	10. 8. 0.12	1. 9.17	5.697580
2	9. 6.59.43	0.38.47	5.705611	10. 9. 5.28	1.10. 2	5.697380
3	9. 8. 2.39	0.40. 4	5.705278	10.10.10.49	1.10.45	5.697186
4	9. 9. 5.40	0.41.19	5.704948	10.11.16.13	1.11.27	5.696998
5	9.10. 8.48	0.42.34	5.704620	10.12.21.39	1.12. 8	5.696817
6	9.11.12. 1	0.43.49	5.704296	10.13.27.10	1.12.46	5.696643
7	9.12.15.19	0.45. 2	5.703975	10.14.32.44	1.13.24	5.696475
8	9.13.18.44	0.46.15	5.703658	10.15.38.19	1.13.59	5.696313
9	9.14.22.14	0.47.27	5.703344	10.16.43.59	1.14.33	5.696159
10	9.15.25.49	0.48.38	5.703034	10.17.49.41	1.15. 6	5.696010
11	9.16.29.30	0.49.48	5.702727	10.18.55.26	1.15.36	5.695869
12	9.17.33.16	0.50.57	5.702424	10.20. 1.13	1.16. 6	5.695734
13	9.18.37. 7	0.52. 5	5.702126	10.21. 7. 2	1.16.33	5.695606
14	9.19.41. 4	0.53.12	5.701832	10.22.12.53	1.16.59	5.695486
15	9.20.45. 6	0.54.19	5.701542	10.23.18.47	1.17.23	5.695372
16	9.21.49.13	0.55.24	5.701257	10.24.24.43	1.17.46	5.695266
17	9.22.53.24	0.56.28	5.700974	10.25.30.41	1.18. 6	5.695167
18	9.23.57.41	0.57.31	5.700698	10.26.36.41	1.18.26	5.695074
19	9.25. 2. 3	0.58.33	5.700427	10.27.42.42	1.18.43	5.694989
20	9.26. 6.29	0.59.33	5.700160	10.28.48.44	1.18.58	5.694911
21	9.27.11. 1	1. 0.33	5.699899	10.29.54.48	1.19.12	5.694842
22	9.28.15.37	1. 1.31	5.699642	11. 1. 0.53	1.19.24	5.694779
23	9.29.20.17	1. 2.28	5.699391	11. 2. 6.59	1.19.35	5.694723
24	10. 0.25. 2	1. 3.24	5.699145	11. 3.13. 6	1.19.43	5.694675
25	10. 1.29.52	1. 4.19	5.698904	11. 4.19.14	1.19.50	5.694634
26	10. 2.34.45	1. 5.12	5.698669	11. 5.25.23	1.19.55	5.694601
27	10. 3.39.41	1. 6. 4	5.698440	11. 6.31.33	1.19.58	5.694575
28	10. 4.44.44	1. 6.54	5.698216	11. 7.37.42	1.20. 0	5.694555
29	10. 5.49.49	1. 7.43	5.697999	11. 8.43.52	1.20. 0	5.694544
30	10. 6.54.58	1. 8.31	5.697786	11. 9.50. 2	1.19.58	5.694540

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Tabula Loci Heliocentrici

Anom med.	Sig. 6.			Sig. 7		
	Long. ♃ à 1 * ♈	Inc. Au.	Dis. à ☉ Cur	Long. ♃ à 1 * ♈	Inc. Au.	Dis. à ☉ Cur
°	s ° ′ ″	° ′ ″	Logarithm	s ° ′ ″	° ′ ″	Logarithm.
0	11. 9.50. 2	1.19.58	5.694540	0.12.45. 3	1. 5.44	5.697793
1	11.10.56.12	1.19.54	5.694545	0.13.50.12	1. 4.52	5.698006
2	11.12. 2.22	1.19.48	5.694556	0.14.55.18	1. 3.58	5.698223
3	11.13. 8.31	1.19.41	5.694576	0.16. 0.20	1. 3. 2	5.698447
4	11.14.14.40	1.19.32	5.694602	0.17. 5.16	1. 2. 6	5.698676
5	11.15.20.49	1.19.21	5.694635	0.18.10. 9	1. 1. 8	5.698911
6	11.16.26.57	1.19. 8	5.694677	0.19.14.59	1. 0. 9	5.699153
7	11.17.33. 4	1.18.53	5.694725	0.20.19.44	0.59. 9	5.699399
8	11.18.39.10	1.18.37	5.694781	0.21.24.24	0.58. 7	5.699650
9	11.19.45.15	1.18.19	5.694844	0.22.28.59	0.57. 5	5.699906
10	11.20.51.19	1.18. 0	5.694914	0.23.33.31	0.56. 1	5.700167
11	11.21.57.21	1.17.38	5.694992	0.24.37.57	0.54.56	5.700435
12	11.23. 3.22	1.17.15	5.695077	0.25.42.19	0.53.50	5.700706
13	11.24. 9.22	1.16.51	5.695171	0.26.46.36	0.52.44	5.700982
14	11.25.15.20	1.16.24	5.695270	0.27.50.46	0.51.36	5.701264
15	11.26.21.15	1.15.56	5.695376	0.28.54.53	0.50.27	5.701549
16	11.27.27. 9	1.15.26	5.695490	0.29.38.55	0.49.17	5.701839
17	11.28.33. 0	1.14.55	5.695611	1. 1. 2.52	0.48. 6	5.702133
18	11.29.38.50	1.14.22	5.695738	1. 2. 6.43	0.46.54	5.702432
19	0. 0.44.37	1.13.47	5.695874	1. 3.10.29	0.45.41	5.702735
20	0. 1.50.22	1.13.11	5.696016	1. 4.14.10	0.44.28	5.703041
21	0. 2.56. 3	1.12.33	5.696164	1. 5.17.45	0.43.14	5.703351
22	0. 4. 1.43	1.11.53	5.696319	1. 6.21.15	0.41.59	5.703665
23	0. 5. 7.18	1.11.12	5.696481	1. 7.24.40	0.40.43	5.703982
24	0. 6.12.52	1.10.30	5.696649	1. 8.27.58	0.39.26	5.704302
25	0. 7.18.23	1. 9.46	5.696824	1. 9.31.10	0.38. 9	5.704626
26	0. 8.23.49	1. 9. 0	5.697005	1.10.34.17	0.36.51	5.704954
27	0. 9.29.13	1. 8.14	5.697192	1.11.37.19	0.35.33	5.705284
28	0.10.34.33	1. 7.25	5.697386	1.12.40.14	0.34.14	5.705617
29	0.11.39.50	1. 6.35	5.697587	1.13.43. 5	0.32.54	5.705954
30	0.12.45. 3	1. 5.44	5.697793	1.14.45.49	0.31.34	5.706293

JOVIS
Tabula Loci Heliocentrici.

Anom. med.	Sig. 8. Long. ♃ à 1 ✱ ♈	Sig. 8. Inc. Au.	Sig. 8. Dis. à ☉ Cur.	Sig. 9. Long. ♃ à 1 ✱ ♈	Sig. 9. Inc. Bor.	Sig. 9. Dis. à ☉ Cur.
0	s ° ′ ″	° ′ ″	Logarithm.	s ° ′ ″	° ′ ″	Logarithm.
0	1.14.45.49	0.31.34	5.706293	2.15.20.46	0.10.14	5.717099
1	1.15.48.28	0.30.13	5.706634	2.16.20.21	0.11.36	5.717462
2	1.16.51. 0	0.28.52	5.706978	2.17.19.50	0.12.58	5.717823
3	1.17.53.26	0.27.31	5.707324	2.18.19.14	0.14.20	5.718182
4	1.18.55.46	0.26. 9	5.707672	2.19.18.31	0.15.41	5.718540
5	1.19.58. 0	0.24.46	5.708023	2.20.17.44	0.17. 2	5.718898
6	1.21. 0. 9	0.23.23	5.708376	2.21.16.49	0.18.23	5.719253
7	1.22. 2.11	0.22. 0	5.708729	2.22.15.49	0.19.43	5.719607
8	1.23. 4. 7	0.20.37	5.709085	2.23.14.43	0.21. 2	5.719959
9	1.24. 5.57	0.19.13	5.709443	2.24.13.31	0.22.21	5.720309
10	1.25. 7.41	0.17.49	5.709802	2.25.12.14	0.23.40	5.720658
11	1.26. 9.18	0.16.25	5.710162	2.26.10.52	0.24.58	5.721005
12	1.27.10.51	0.15. 1	5.710524	2.27. 9.23	0.26.15	5.721349
13	1.28.12.16	0.13.37	5.710887	2.28. 7.49	0.27.32	5.721691
14	1.29.13.35	0.12.12	5.711250	2.29. 6. 9	0.28.48	5.722031
15	2. 0.14.48	0.10.48	5.711614	3. 0. 4.24	0.30. 4	5.722368
16	2. 1.15.55	0. 9.23	5.711978	3. 1. 2.34	0.31.19	5.722704
17	2. 2.16.56	0. 7.58	5.712344	3. 2. 0.38	0.32.33	5.723038
18	2. 3.17.51	0. 6.34	5.712711	3. 2.58.37	0.33.47	5.723367
19	2. 4.18.39	0. 5. 9	5.713078	3. 3.56.30	0.35. 0	5.723694
20	2. 5.19.21	0. 3.44	5.713444	3. 4.54.19	0.36.12	5.724020
21	2. 6.19.57	0. 2.20	5.713810	3. 5.52. 2	0.37.24	5.72434
22	2. 7.20.27	0. 0.55	5.714178	3. 6.49.40	0.38.35	5.724661
23	2. 8.20.51	Bor 0.29	5.714545	3. 7.47.13	0.39.45	5.724977
24	2. 9.21. 8	0. 1.53	5.714911	3. 8.44.41	0.40.54	5.725290
25	2.10.21.20	0. 3.17	5.715278	3. 9.42. 4	0.42. 3	5.725601
26	2.11.21.25	0. 4.41	5.715644	3.10.39.23	0.43.10	5.72590
27	2.12.21.25	0. 6. 5	5.716008	3.11.36.36	0.44.17	5.72620
28	2.13.21.18	0. 7.28	5.716373	3.12.33.45	0.45.23	5.72651
29	2.14.21. 5	0. 8.51	5.716737	3.13.30.49	0.46.29	5.72680
30	2.15.20.46	0.10.14	5.717099	3.14.27.49	0.47.33	5.72709

JOVIS

Tabula Loci Heliocentrici.

Anom. med.	Sig. 10. Long. ♃ à 1 ✶ ♈	Sig. 10. Inc. Bor.	Sig. 10. Dis. à ☉ Cur	Sig. 11. Long. ♃ à 1 ✶ ♈	Sig. 11. Inc. Bor.	Sig. 11. Dis. à ☉ Cur
°	s ° ′ ″	° ′ ″	Logarithm.	s ° ′ ″	° ′ ″	Logarithm.
0	3.14.27.49	0.47.33	5.727099	4.12.26.58	1.12.11	5.733974
1	3.15.24.42	0.48.37	5.727390	4.13.22. 7	1.12.43	5.734131
2	3.16.21.33	0.49.39	5.727676	4.14.17.14	1.13.15	5.734283
3	3.17.18.18	0.50.41	5.727958	4.15.12.19	1.13.45	5.734430
4	3.18.15. 0	0.51.42	5.728236	4.16. 7.21	1.14.14	5.734572
5	3.19.11.36	0.52.42	5.728510	4.17. 2.22	1.14.42	5.734708
6	3.20. 8. 9	0.53.41	5.728781	4.17.57.20	1.15. 9	5.734841
7	3.21. 4.38	0.54.39	5.729047	4.18.52.17	1.15.35	5.734968
8	3.22. 1. 2	0.55.36	5.729310	4.19.47.12	1.16. 0	5.735089
9	3.22.57.22	0.56.32	5.729568	4.20.42. 4	1.16.23	5.735206
10	3.23.53.38	0.57.27	5.729823	4.21.36.55	1.16.45	5.735317
11	3.24.49.51	0.58.21	5.730073	4.22.31.45	1.17. 6	5.735422
12	3.25.45.59	0.59.14	5.730320	4.23.26.32	1.17.26	5.735522
13	3.26.42. 4	1. 0. 6	5.730563	4.24.21.19	1.17.45	5.735617
14	3.27.38. 6	1. 0.58	5.730800	4.25.16. 4	1.18. 2	5.735706
15	3.28.34. 3	1. 1.48	5.731032	4.26.10.48	1.18.18	5.735791
16	3.29.29.57	1. 2.37	5.731261	4.27. 5.30	1.18.33	5.735870
17	4. 0.25.47	1. 3.25	5.731485	4.28. 0.11	1.18.47	5.735944
18	4. 1.21.34	1. 4.12	5.731705	4.28.54.52	1.19. 0	5.736011
19	4. 2.17.18	1. 4.58	5.731920	4.29.49.31	1.19.11	5.736074
20	4. 3.12.58	1. 5.43	5.732132	5. 0.44. 9	1.19.21	5.736131
21	4. 4. 8.35	1. 6.26	5.732337	5. 1.38.47	1.19.31	5.736183
22	4. 5. 4.10	1. 7. 9	5.732538	5. 2.33.24	1.19.38	5.736229
23	4. 5.59.41	1. 7.51	5.732734	5. 3.28. 0	1.19.45	5.736271
24	4. 6.55. 8	1. 8.31	5.732927	5. 4.22.35	1.19.50	5.736307
25	4. 7.50.34	1. 9.11	5.733113	5. 5.17.10	1.19.55	5.736337
26	4. 8.45.56	1. 9.49	5.733295	5. 6.11.45	1.19.58	5.736361
27	4. 9.41.16	1.10.26	5.733473	5. 7. 6.20	1.19.59	5.736380
28	4.10.36.33	1.11. 2	5.733645	5. 8. 0.54	1.20. 0	5.736394
29	4.11.31.47	1.11.37	5.733812	5. 8.55.28	1.19.59	5.736402
30	4.12.26.58	1.12.11	5.733974	5. 9.50. 2	1.19.58	5.736406

MARTIS
Tabula Motus Medij ab Aphelio.

Ann. Chr. Cur.	Anomalia ♂ s ° ' "
1.	9. 2. 3.36
1501	3. 7.33.36
1581	9.19.51.12
1601	5. 7.55.36
1621	0.26. 0. 0
1641	8.14. 4.24
1661	4. 2. 8.48
1681	11.20.13.12
1701	7. 8.17.36
1721	2.26.22. 0
1741	10.14.26.24
1761	6. 2.30.48
1781	1.20.35.12
1801	9. 8.39.36
1901	11. 9. 1.36
2001	1. 9.23.36

An. nis.	Mot. anom. s ° ' "
20	7.18. 4.24
40	3. 6. 8.48
60	10.24.13.12
80	6.12.17.36
100	2. 0.22. 0
200	4. 0.44. 0
300	6. 1. 6. 0
400	8. 1.28. 0
500	10. 1.50. 0
600	0. 2.12. 0
700	2. 2.34. 0
800	4. 2.56. 0
900	6. 3.18. 0
1000	8. 3.40. 0
2000	4. 7.20. 0
3000	0.11. 0. 0
4000	8.14.40. 0
5000	4.18.20. 0
6000	0.22. 0. 0

An-nis.	Mot. anom. s ° ' "
1	6.11.16.22
2	0.22.32.43
3	7. 3.49. 5
4	1.15.36.53
5	7.26.53.14
6	2. 8. 9.36
7	8.19.25.58
8	3. 1.13.46
9	9.12.30. 7
10	3.23.46.29
11	10. 5. 2.50
12	4.16.50.38
13	10.28. 7. 0
14	5. 9.23.22
15	11.20.39.43
16	6. 2.27.31
17	0.13.43.53
18	6.25. 0.14
19	1. 6.16.36
20	7.18. 4.24

Menſ. A.Cō	Mot. anom. s ° ' "
Janua.	0. 0. 0. 0
Febr.	0.16.14.42
Mart.	1. 0.55. 5
April.	1.17. 9.47
Maij.	2. 2.53. 3
Junij.	2.19. 7.45
Julij.	3. 4.51. 1
Aug.	3.21. 5.43
Sept.	4. 7.20.26
Octo.	4.23. 3.41
Nov.	5. 9.18.24
Decē.	5.25. 1.39

In anno Biſſextili, poſt Februarium, adde unum diem & unius diei motum.

Dies.	Mot. anom. ° ' "
1	0.31.27
2	1. 2.53
3	1.34.20
4	2. 5.46
5	2.37.13
6	3. 8.39
7	3.40. 6
8	4.11.32
9	4.42.59
10	5.14.25
11	5.45.52
12	6.17.18
13	6.48.45
14	7.20.11
15	7.51.38
16	8.23. 4
17	8.54.31
18	9.25.57
19	9.57.24
20	10.28.50
21	11. 0.17
22	11.31.44
23	12. 3.10
24	12.34.37
25	13. 6. 3
26	13.37.30
27	14. 8.56
28	14.40.23
29	15.11.49
30	15.43.16
31	16.14.42
32	16.46. 9

Hor. '	Mot. anom. ° ' " / ' " ‴
1	0. 1.19
2	0. 2.37
3	0. 3.56
4	0. 5.14
5	0. 6.33
6	0. 7.52
7	0. 9.10
8	0.10.29
9	0.11.47
10	0.13. 6
11	0.14.25
12	0.15.43
13	0.17. 2
14	0.18.20
15	0.19.39
16	0.20.58
17	0.22.16
18	0.23.35
19	0.24.53
20	0.26.12
21	0.27.31
22	0.28.49
23	0.30. 8
24	0.31.27
25	0.32.45
26	0.34. 4
27	0.35.22
28	0.36.41
29	0.38. 0
30	0.39.18

H. '	Mot. anom. ° ' " / ' " ‴
31	0.40.37
32	0.41.55
33	0.43.14
34	0.44.33
35	0.45.51
36	0.47.10
37	0.48.28
38	0.49.47
39	0.51. 6
40	0.52.24
41	0.53.43
42	0.55. 1
43	0.56.20
44	0.57.39
45	0.58.57
46	1. 0.16
47	1. 1.34
48	1. 2.53
49	1. 4.12
50	1. 5.30
51	1. 6.49
52	1. 8. 7
53	1. 9.26
54	1.10.45
55	1.12. 3
56	1.13.22
57	1.14.40
58	1.15.59
59	1.17.18
60	1.18.36

	s ° ' "
Long. Aphel. ♂ à 1 ✱ ♈	4. 1. 12. 0.
Long. ☊ ♂ à 1 ✱ ♈	0. 19. 10. 0.
Incli. Orb. ♂	1. 52. 0.
Diſt. med. ♂ à ☉	152369
Eccentricitas	14100

MARTIS
Tabula Loci Heliocentrici.

Anom. med.	Sig. 0.			Sig. 1.		
	Long. ♂ à 1 * ♈	Inc. Bor.	Dis. à ☉ Cur	Long. ♂ à 1 * ♈	Inc. Bor.	Dis. à ☉ Cur
°	s ° ′ ″	° ′ ″	Logarithm.	s ° ′ ″	° ′ ″	Logarithm
0	4. 1.12.22	1.49.32	5.221113	4.26.23.59	1.29.11	5.216997
1	4. 2. 2.27	1.49.11	5.221110	4.27.15. 2	1.28.10	5.216719
2	4. 2.52.32	1.48.49	5.221098	4.28. 6. 9	1.27. 8	5.216433
3	4. 3.42.37	1.48.25	5.221076	4.28.57.20	1.26. 4	5.216137
4	4. 4.32.42	1.48. 0	5.221044	4.29.48.34	1.25. 0	5.215832
5	4. 5.22.47	1.47.33	5.221003	5. 0.39.54	1.23.54	5.215519
6	4. 6.12.53	1.47. 5	5.220953	5. 1.31.18	1.22.47	5.215197
7	4. 7. 3. 1	1.46.36	5.220894	5. 2.22.47	1.21.39	5.214866
8	4. 7.53. 8	1.46. 5	5.220826	5. 3.14.20	1.20.29	5.214527
9	4. 8.43.17	1.45.33	5.220748	5. 4. 5.58	1.19.18	5.214179
10	4. 9.33.27	1.44.59	5.220661	5. 4.57.41	1.18. 6	5.213823
11	4.10.23.38	1.44.24	5.220565	5. 5.49.29	1.16.53	5.213458
12	4.11.13.51	1.43.48	5.220460	5. 6.41.22	1.15.39	5.213084
13	4.12. 4. 6	1.43.11	5.220345	5. 7.33.21	1.14.24	5.212702
14	4.12.54.22	1.42.32	5.220221	5. 8.25.26	1.13. 7	5.212312
15	4.13.44.39	1.41.52	5.220088	5. 9.17.36	1.11.49	5.211914
16	4.14.34.58	1.41.10	5.219946	5.10. 9.52	1.10.30	5.211507
17	4.15.25.19	1.40.27	5.219795	5.11. 2.13	1. 9.10	5.211092
18	4.16.15.43	1.39.43	5.219634	5.11.54.41	1. 7.49	5.210668
19	4.17. 6. 8	1.38.57	5.219464	5.12.47.15	1. 6.27	5.210237
20	4.17.56.37	1.38.11	5.219285	5.13.39.55	1. 5. 3	5.209798
21	4.18.47. 8	1.37.22	5.219097	5.14.32.42	1. 3.39	5.209351
22	4.19.37.40	1.36.33	5.218900	5.15.25.35	1. 2.13	5.208896
23	4.20.28.17	1.35.42	5.218694	5.16.18.35	1. 0.47	5.208433
24	4.21.18.56	1.34.50	5.218478	5.17.11.41	0.59.19	5.207962
25	4.22. 9.38	1.33.57	5.218254	5.18. 4.55	0.57.50	5.207484
26	4.23. 0.24	1.33. 2	5.218020	5.18.58.15	0.56.21	5.206998
27	4.23.51.12	1.32. 6	5.217777	5.19.51.43	0.54.50	5.206504
28	4.24.42. 4	1.31. 9	5.217526	5.20.45.19	0.53.18	5.206003
29	4.25.32.59	1.30.11	5.217267	5.21.39. 2	0.51.45	5.205495
30	4.26.23.59	1.29.11	5.216997	5.22.32.53	0.50.12	5.204979

MARTIS
Tabula Loci Heliocentrici.

Anom med.	Sig. 2. Long. ♂ à 1 ✳ ♈	Inc. Bor.	Dis. à ☉ Cur	Sig. 3. Long. ♂ à 1 ✳ ♈	Inc. Au.	Dis. à ☉ Cur
	s ° ' ''	° ' ''	Logarithm.	s ° ' ''	° ' ''	Logarithm.
0	5.22.32.53	0.50.12	5.204979	6.20.37.31	0. 2.51	5.186600
1	5.23.26.51	0.48.37	5.204456	6.21.36.18	0. 4.46	5.185911
2	5.24.20.57	0.47. 1	5.203925	6.22.35.17	0. 6.41	5.185219
3	5.25.15.12	0.45.25	5.203388	6.23.34.27	0. 8.37	5.184525
4	5.26. 9.34	0.43.47	5.202844	6.24.33.48	0.10.[illegible]	5.183827
5	5.27. 4. 4	0.42. 9	5.202292	6.25.33.21	0.12.28	5.183127
6	5.27.58.42	0.40.30	5.201734	6.26.33. 7	0.14.24	5.182424
7	5.28.53.29	0.38.49	5.201169	6.27.33. 3	0.16.20	5.181719
8	5.29.48.25	0.37. 8	5.200598	6.28.33.12	0.18.16	5.181012
9	6. 0.43.30	0.35.26	5.200020	6.29.33.32	0.20.13	5.180302
10	6. 1.38.44	0.33.44	5.199436	7. 0.34. 5	0.22. 9	5.179592
11	6. 2.34. 7	0.32. 0	5.198846	7. 1.34.49	0.24. 5	5.178880
12	6. 3.29.39	0.30.16	5.198249	7. 2.35.45	0.26. 1	5.178167
13	6. 4.25.21	0.28.31	5.197646	7. 3.36.55	0.27.57	5.177452
14	6. 5.21.12	0.26.45	5.197038	7. 4.38.15	0.29.53	5.176737
15	6. 6.17.11	0.24.58	5.196424	7. 5.39.48	0.31.49	5.176021
16	6. 7.13.21	0.23.11	5.195804	7. 6.41.34	0.33.44	5.175305
17	6. 8. 9.41	0.21.23	5.195178	7. 7.43.31	0.35.39	5.174589
18	6. 9. 6.10	0.19.35	5.194546	7. 8.45.41	0.37.34	5.173872
19	6.10. 2.49	0.17.45	5.193909	7. 9.48. 3	0.39.29	5.173156
20	6.10.59.38	0.15.56	5.193267	7.10.50.38	0.41.23	5.172442
21	6.11.56.38	0.14. 5	5.192620	7.11.53.25	0.43.17	5.171728
22	6.12.53.48	0.12.14	5.191969	7.12.56.24	0.45.10	5.171015
23	6.13.51. 9	0.10.23	5.191313	7.13.59.37	0.47. 2	5.170304
24	6.14.48.39	0. 8.31	5.190652	7.15. 3. 2	0.48.54	5.169594
25	6.15.46.21	0. 6.38	5.189987	7.16. 6.39	0.50.46	5.168886
26	6.16.44.13	0. 4.45	5.189318	7.17.10.29	0.52.37	5.168180
27	6.17.42.16	0. 2.52	5.188644	7.18.14.31	0.54.27	5.167478
28	6.18.40.29	0. 0.58	5.187966	7.19.18.46	0.56.16	5.166777
29	6.19.38.54	Au0.57	5.187285	7.20.23.13	0.58. 4	5.166079
30	6.20.37.31	0. 2.51	5.186600	7.21.27.53	0.59.52	5.165385

MARTIS
Tabula Loci Heliocentrici.

Anom med.	Sig. 4. Long. ʒ à 1 ✱ ♈	Inc. Au.	Dis. à ☉ Cur	Sig. 5. Long. ʒ à 1 ✱ ♈	Inc. Au.	Dis. à ☉ Cur
0	s ° ′ ″	° ′ ″	Logarithm.	s ° ′ ″	° ′ ″	Logarithm.
0	7.21.27.53	0.59.52	5.165385	8.25.18.17	1.42.26	5.147570
1	7.22.32.44	1. 1.38	5.164695	8.26.28.39	1.43.20	5.147125
2	7.23.37.49	1. 3.24	5.164008	8.27.39. 9	1.44.12	5.146692
3	7.24.43. 5	1. 5. 8	5.163326	8.28.49.48	1.45. 1	5.146273
4	7.25.48.34	1. 6.52	5.162648	9. 0. 0.34	1.45.48	5.145866
5	7.26.54.16	1. 8.34	5.161976	9. 1.11.27	1.46.32	5.145472
6	7.28. 0. 9	1.10.15	5.161308	9. 2.22.29	1.47.14	5.145093
7	7.29. 6.15	1.11.55	5.160645	9. 3.33.37	1.47.52	5.144727
8	8. 0.12.33	1.13.33	5.159988	9. 4.44.53	1.48.28	5.144375
9	8. 1.19. 3	1.15.11	5.159337	9. 5.56.16	1.49. 2	5.144037
10	8. 2.25.44	1.16.46	5.158692	9. 7. 7.44	1.49.32	5.143713
11	8. 3.32.37	1.18.21	5.158054	9. 8.19.19	1.50. 0	5.143405
12	8. 4.39.43	1.19.53	5.157423	9. 9.31. 0	1.50.25	5.143110
13	8. 5.47. 0	1.21.25	5.156798	9.10.42.46	1.50.47	5.142831
14	8. 6.54.29	1.22.54	5.156182	9.11.54.38	1.51. 6	5.142567
15	8. 8. 2. 8	1.24.22	5.155573	9.13. 6.35	1.51.23	5.142318
16	8. 9. 9.59	1.25.49	5.154972	9.14.18.36	1.51.36	5.142085
17	8.10.18. 1	1.27.13	5.154379	9.15.30.43	1.51.46	5.141867
18	8.11.26.15	1.28.36	5.153795	9.16.42.53	1.51.54	5.141666
19	8.12.34.39	1.29.56	5.153220	9.17.55. 7	1.51.58	5.141480
20	8.13.43.14	1.31.15	5.15265[illegible]	9.19. 7.25	1.52. 0	5.141309
21	8.14.51.59	1.32.32	5.152099	9.20.19.45	1.51.58	5.141156
22	8.16. 0.55	1.33.47	5.151553	9.21.32. 9	1.51.54	5.141018
23	8.17.10. 2	1.35. 0	5.151017	9.22.44.35	1.51.47	5.140896
24	8.18.19.18	1.36.10	5.150491	9.23.57. 4	1.51.37	5.140791
25	8.19.28.44	1.37.18	5.149976	9.25. 9.34	1.51.23	5.140702
26	8.20.38.20	1.38.25	5.149472	9.26.22. 6	1.51. 7	5.140629
27	8.21.48. 6	1.39.28	5.148979	9.27.34.49	1.50.48	5.140572
28	8.22.58. 1	1.40.30	5.148497	9.28.47.13	1.50.26	5.140533
29	8.24. 8. 4	1.41.29	5.148028	9.29.59.47	1.50. 0	5.140511
30	8.25.18.17	1.42.26	5.147570	10. 1.12.22	1.49.32	5.140505

MARTIS
Tabula Loci Heliocentrici.

Anom med.	Sig. 6.			Sig. 7.		
·	Long. ♂ à 1 ✶ ♈	Inc. Au.	Dis. à ☉ Cur.	Long. ♂ à 1 ✶ ♈	Inc. Au.	Dis. à ☉ Cur.
0	s ° ′ ″	° ′ ″	Logarithm.	s ° ′ ″	° ′ ″	Logarithm.
0	10. 1.12.22	1.49.32	5.140505	11. 7. 5.56	1.15. 3	5.147659
1	10. 2.24.57	1.49. 1	5.140515	11. 8.16. 8	1.13.21	5.148118
2	10. 3.37.31	1.48.27	5.140541	11. 9.26.10	1.11.36	5.148589
3	10. 4.50. 5	1.47.50	5.140584	11.10.36. 4	1. 9.50	5.149071
4	10. 6. 2.38	1.47.11	5.140645	11.11.45.47	1. 8. 3	5.149564
5	10. 7.15.10	1.46.28	5.140722	11.12.55.21	1. 6.14	5.150069
6	10. 8.27.40	1.45.43	5.140815	11.14. 4.46	1. 4.24	5.150585
7	10. 9.40. 8	1.44.55	5.140924	11.15.14. 0	1. 2.32	5.151111
8	10.10.52.34	1.44. 4	5.141049	11.16.23. 5	1. 0.39	5.151647
9	10.12. 4.57	1.43.10	5.141190	11.17.31.59	0.58.45	5.152193
10	10.13.17.26	1.42.14	5.141348	11.18.40.42	0.56.50	5.152749
11	10.14.29.33	1.41.15	5.141522	11.19.49.15	0.54.54	5.15331
12	10.15.41.46	1.40.13	5.141711	11.20.57.37	0.52.57	5.15388
13	10.16.53.55	1.39. 9	5.141916	11.22. 5.49	0.50.59	5.15447
14	10.18. 6. 0	1.38. 2	5.142137	11.23.13.50	0.49. 0	5.15506
15	10.19.18. 0	1.36.52	5.142374	11.24.21.40	0.47. 0	5.15566
16	10.20.29.56	1.35.41	5.142626	11.25.29.18	0.45. 0	5.15627
17	10.21.41.48	1.34.26	5.142893	11.26.36.44	0.42.58	5.15688
18	10.22.53.33	1.33.10	5.143174	11.27.43.59	0.40.56	5.15750
19	10.24. 5.13	1.31.51	5.143471	11.28.51. 3	0.38.54	5.15813
20	10.25.16.46	1.30.29	5.143783	11.29.57.54	0.36.51	5.15877
21	10.26.28.13	1.29. 9	5.144109	0. 1. 4.35	0.34.47	5.15941
22	10.27.39.34	1.27.40	5.144449	0. 2.11. 3	0.32.43	5.16006
23	10.28.50.49	1.26.13	5.144804	0. 3.17.20	0.30.39	5.16072
24	11. 0. 1.55	1.24.43	5.145172	0. 4.23.24	0.28.35	5.16138
25	11. 1.12.55	1.23.11	5.145554	0. 5.29.16	0.26.30	5.16204
26	11. 2.23.48	1.21.37	5.145950	0. 6.34.56	0.24.25	5.16271
27	11. 3.34.32	1.20. 1	5.146358	0. 7.40.24	0.22.19	5.16339
28	11. 4.45. 9	1.18.24	5.146779	0. 8.45.40	0.20.14	5.16407
29	11. 5.55.37	1.16.44	5.147213	0. 9.50.44	0.18. 9	5.16475
30	11. 7. 5.56	1.15. 3	5.147659	0.10.55.34	0.16. 4	5.16544

MARTIS
Tabula Loci Heliocentrici.

Anom med	Sig. 8.			Sig. 9.		
	Long. ♉ à 1 ✶ ♈.	Inc. Au.	Dis. à ☉ Cur	Long. ♉ à 1 ✶ ♈.	Inc. Bor.	Dis. à ☉ Cur
o	s o ′ ″	o ′ ″	Logarithm.	s o ′ ″	o ′ ″	Logarithm
0	0.10.55.34	0.16. 4	5.165446	1.11.45.47	0.43. 3	5.186566
1	0.12. 0.13	0.13.58	5.166137	1.12.44.24	0.44.48	5.187248
2	0.13. 4.39	0.11.53	5.166832	1.13.42.50	0.46.33	5.187926
3	0.14. 8.53	0. 9.48	5.167530	1.14.41. 4	0.48.16	5.188601
4	0.15.12.54	0. 7.43	5.168230	1.15.39. 9	0.49.58	5.189272
5	0.16.16.43	0. 5.39	5.168932	1.16.37. 2	0.51.39	5.189939
6	0.17.20.19	0. 3.35	5.169638	1.17.34.45	0.53.18	5.190601
7	0.18.23.43	0. 1.31	5.170345	1.18.32.16	0.54.57	5.191260
8	0.19.26.54	Bor 0.33	5.171053	1.19.29.37	0.56.34	5.191913
9	0.20.29.53	0. 2.36	5.171762	1.20.26.48	0.58.10	5.192562
10	0.21.32.40	0. 4.39	5.172473	1.21.23.48	0.59.45	5.193206
11	0.22.35.14	0. 6.41	5.173184	1.22.20.38	1. 1.18	5.193846
12	0.23.37.36	0. 8.43	5.173897	1.23.17.18	1. 2.51	5.194480
13	0.24.39.45	0.10.44	5.174610	1.24.13.48	1. 4.21	5.195110
14	0.25.41.42	0.12.44	5.175323	1.25.10. 9	1. 5.51	5.195733
15	0.26.43.27	0.14.44	5.176036	1.26. 6.20	1. 7.19	5.196351
16	0.27.45. 1	0.16.43	5.176748	1.27. 2.21	1. 8.46	5.196964
17	0.28.46.21	0.18.42	5.177460	1.27.58.12	1.10.12	5.197570
18	0.29.47.30	0.20.39	5.178171	1.28.53.55	1.11.36	5.198172
19	1. 0.48.26	0.22.36	5.178882	1.29.49.29	1.12.59	5.198767
20	1. 1.49.11	0.24.32	5.179590	2. 0.44.53	1.14.21	5.199355
21	1. 2.49.43	0.26.28	5.180297	2. 1.40. 7	1.15.41	5.199938
22	1. 3.50. 3	0.28.22	5.181003	2. 2.35.13	1.17. 0	5.200514
23	1. 4.50.12	0.30.16	5.181707	2. 3.30.11	1.18.17	5.201084
24	1. 5.50. 9	0.32. 8	5.182409	2. 4.24.59	1.19.33	5.201648
25	1. 6.49.55	0.34. 0	5.183109	2. 5.19.39	1.20.48	5.202205
26	1. 7.49.28	0.35.51	5.183806	2. 6.14.11	1.22. 1	5.202755
27	1. 8.48.50	0.37.40	5.184500	2. 7. 8.35	1.23.13	5.203299
28	1. 9.48. 1	0.39.29	5.185191	2. 8. 2.51	1.24.23	5.203835
29	1.10.47. 0	0.41.16	5.185880	2. 8.56.58	1.25.32	5.204365
30	1.11.45.47	0.43. 3	5.186566	2. 9.50.57	1.26.40	5.204887

MARTIS
Tabula Loci Heliocentrici.

Anom. med.	Sig. 10.			Sig. 11.		
	Long. ♂ à 1 * ♈	Inc. Bor.	Dis. à ☉ Cur.	Long. ♂ à 1 * ♈	Inc. Bor.	Dis. à ☉ Cur.
°	s ° ′ ″	° ′ ″	Logarithm.	s ° ′ ″	° ′ ″	Logarithm.
0	2. 9.50.57	1.26.40	5.204887	3. 6. 0.30	1.49. 4	5.216925
1	2.10.44.49	1.27.46	5.205402	3. 6.51.30	1.49.26	5.217196
2	2.11.38.33	1.28.50	5.205910	3. 7.42.27	1.49.46	5.217458
3	2.12.32.10	1.29.53	5.206411	3. 8.33.19	1.50. 5	5.217710
4	2.13.25.40	1.30.55	5.206904	3. 9.24. 8	1.50.23	5.217955
5	2.14.19. 2	1.31.55	5.207390	3.10.14.55	1.50.39	5.218191
6	2.15.12.17	1.32.54	5.207868	3.11. 5.37	1.50.53	5.218417
7	2.16. 5.25	1.33.52	5.208339	3.11.56.17	1.51. 7	5.218635
8	2.16.58.27	1.34.47	5.208802	3.12.46.54	1.51.18	5.218843
9	2.17.51.21	1.35.42	5.209257	3.13.37.28	1.51.29	5.219042
10	2.18.44. 9	1.36.35	5.209705	3.14.28. 0	1.51.37	5.219233
11	2.19.36.50	1.37.26	5.210144	3.15.18.29	1.51.45	5.219415
12	2.20.29.26	1.38.16	5.210576	3.16. 8.55	1.51.51	5.219587
13	2.21.21.55	1.39. 5	5.211000	3.16.59.19	1.51.55	5.219750
14	2.22.14.18	1.39.52	5.211415	3.17.49.41	1.51.58	5.219904
15	2.23. 6.35	1.40.37	5.211823	3.18.40. 2	1.52. 0	5.220048
16	2.23.58.46	1.41.21	5.212222	3.19.30.20	1.52. 0	5.220184
17	2.24.50.52	1.42. 4	5.212613	3.20.20.36	1.51.59	5.220311
18	2.25.42.52	1.42.45	5.212995	3.21.10.51	1.51.56	5.220428
19	2.26.34.47	1.43.25	5.213369	3.22. 1. 4	1.51.52	5.220536
20	2.27.26.37	1.44. 3	5.213736	3.22.51.15	1.51.46	5.220634
21	2.28.18.21	1.44.40	5.214094	3.23.41.26	1.51.39	5.220724
22	2.29.10. 0	1.45.15	5.214443	3.24.31.36	1.51.31	5.220804
23	3. 0. 1.35	1.45.49	5.214783	3.25.21.43	1.51.21	5.220875
24	3. 0.53. 4	1.46.21	5.215115	3.26.11.51	1.51.10	5.220937
25	3. 1.44.29	1.46.52	5.215438	3.27. 1.57	1.50.57	5.220990
26	3. 2.35.50	1.47.21	5.215753	3.27.52. 3	1.50.43	5.221033
27	3. 3.27. 6	1.47.49	5.216059	3.28.42. 8	1.50.27	5.221067
28	3. 4.18.18	1.48.15	5.216357	3.29.32.14	1.50.10	5.221092
29	3. 5. 9.26	1.48.40	5.216645	4. 0.22.18	1.49.52	5.221107
30	3. 6. 0.30	1.49. 4	5.216925	4. 1.12.22	1.49.32	5.221113

VENERIS

Tabula Motus Modii ab Aphelio.

An. Chr. Current.	Anomalia ♀ s ° ′ ″
1	4· 3·48·55
1501	7· 0·22·40
1581	7·14·35·40
1601	1·18· 8·55
1621	7 21·42·10
1641	1·25·15·25
1661	7 28·48·40
1681	2· 2·21·55
1701	8· 5·55·10
1721	2· 9·28·25
1741	8 13· 1·40
1761	2·16·34·55
1781	8·20· 8·10
1801	2·23·41·25
1901	9·11·27·40
2001	3·29·13·55
An-nis.	Mot. anomal.
20	6· 3·33·15
40	0· 7· 6·30
60	6·10·39·45
80	0·14·13· 0
100	6·17·46·15
200	1· 5 32·30
300	7·23·18·45
400	2 11· 5· 0
500	8·28·51·15
600	3·16·37·30
700	10· 4·23·45
800	4·22·10· 0
900	11· 9·56·15
1000	5·27·42·30
2000	11·52·25· 0
3000	5·23· 7·30
4000	11·20·50· 0
5000	5·18·32·30
6000	11·16·15· 0

Annis	Mot. Anom. s ° ′ ″
1	7·14·46·38
2	2·29·33 16
3	10 14·19·54
4	6· 0·42·39
5	1·15·29·17
6	9 0·15·55
7	4·15· 2·33
8	0 1·25·18
9	7·16 11·56
10	3· 0·58·34
11	10·15·45·12
12	6· 2· 7·57
13	1·16·54·35
14	9· 1·41·13
15	4·16·27·51
16	0· 2·50·36
17	7·17·37·14
18	3· 2·23·52
19	0·17·10·30
20	16· 3·33·15

Mens. A. Com	Mot. anom. s ° ′ ″
Janua.	0· 0· 0· 0
Febr.	1·19·39·58
Mart.	3· 4·31·32
April.	4·24·11·30
Maij.	6·12·15·20
Junij.	8 1·55 17
Julij.	9·19·59· 7
Aug.	11· 9·39 5
Sept.	0·29·19 3
Octo.	2 17·22·53
Nove.	4· 7· 2·50
Dece.	5·25· 6·40

In Anno Bissextili, post Februarium, adde unum diem & unius diei motum.

Dies	Mot. Anom. s. ° ′ ″
1	0· 1·36· 8
2	0· 3·12·15
3	0· 4·48·23
4	0· 6·24·31
5	0· 8· 0·38
6	0 9·36·46
7	0·11·12·54
8	0·12·49· 1
9	0·14·25· 9
10	0·16· 1·17
11	0·17·37·24
12	0 19·13·32
13	0·20·49·40
14	0·22·25·47
15	0·24· 1·55
16	0·25 38 3
17	0·27·14·10
18	0·28·50·18
19	1· 0·26·26
20	1· 2· 2·33
21	1· 3·38·41
22	1· 5 14·49
23	1· 6·50·56
24	1· 8·27· 4
25	1·10 3· 12
26	1·11·39·19
27	1·13·15·27
28	1·14·51·35
29	1·16·27·42
30	1·18· 3·50
31	1·19·39·58
32	1·21·16· 5

H ′	Motus Anom. ° ′ ″ / ′ ″ ‴	H. ′	Motus Anom ° ′ ″ / ′ ″ ‴
1	0· 4· 0	31	2· 4·10
2	0· 8· 1	32	2· 8·10
3	0·12· 1	33	2·12 11
4	0·16· 1	34	2·16·11
5	0·20· 2	35	2·20·11
6	0·24· 2	36	2·24·11
7	0·28· 2	37	2·28·12
8	0·32· 3	38	2·32·12
9	0·36· 3	39	2·36·12
10	0 40· 3	40	2 40·13
11	0·44· 4	41	2·44·13
12	0·48· 4	42	2·48·13
13	0·52· 4	43	2·52·14
14	0·56· 4	44	2·56·14
15	1· 0· 5	45	3· 0·14
16	1· 4· 5	46	3· 4·15
17	1· 8· 5	47	3· 8·15
18	1·12· 6	48	3·12·15
19	1·16· 6	49	3·16·16
20	1·20· 6	50	3·20·16
21	1·24· 7	51	3·24·16
22	1·28· 7	52	3·28·17
23	1 32· 7	53	3·32·17
24	1·36· 8	54	3·36·17
25	1·40· 8	55	3·40·18
26	1·44· 8	56	3·44·18
27	1·48· 9	57	3·48·18
28	1·52· 9	58	3·52·19
29	1·56· 9	59	3·56·19
30	2· 0·10	60	4· 0·19

	s	°	′	″
Long. Aph ♀ à 1 ✱ ♈.	9·	5·	0·	0
Long ☊· ♀ à 1 ✱ ♈.	1	15·	16·	0
Incli. Orb. ♀		3·	24·	0

Dist med. ♀ à ☉ ———— 72333

Eccentricitas. ———— 517

VENERIS
Tabula Loci Heliocentrici.

Anom med.	Sig. 0.			Sig. 1.		
	Long.♀ à 1 ✶ ♈	Inc. Au.	Dis. à ☉ Cur	Long.♀ à 1 ✶ ♈	Inc. Au.	Dis. à ☉ Cur
°	s ° ′ ″	° ′ ″	Logarithm.	s ° ′ ″	° ′ ″	Logarithm.
0	9. 4.57. 1	2.35.37	4.861985	10. 4.34.31	3.20.28	4.861284
1	9. 5.56.11	2.37.52	4.861971	10. 5.33.53	3.21. 5	4.861253
2	9. 6.55.21	2.40. 4	4.861957	10. 6.33.15	3.21.39	4.861221
3	9. 7.54.32	2.42.13	4.861941	10. 7.32.38	3.22. 9	4.861189
4	9. 8.53.42	2.44.20	4.861926	10. 8.32. 1	3.22.36	4.861155
5	9. 9.52.53	2.46.23	4.861909	10. 9.31.25	3.22.59	4.861122
6	9.10.52. 5	2.48.23	4.861892	10.10.30.49	3.23.18	4.861088
7	9.11.51.17	2.50.21	4.861874	10.11.30.14	3.23.34	4.861055
8	9.12.50.29	2.52.15	4.861854	10.12.29.40	3.23.46	4.861021
9	9.13.49.42	2.54. 6	4.861834	10.13.29. 6	3.23.54	4.860987
10	9.14.48.55	2.55.55	4.861814	10.14.28.33	3.23.59	4.860952
11	9.15.48. 7	2.57.40	4.861793	10.15.28. 0	3.24. 0	4.860917
12	9.16.47.20	2.59.22	4.861772	10.16.27.27	3.23.57	4.860882
13	9.17.46.34	3. 1. 1	4.861750	10.17.26.56	3.23.51	4.860847
14	9.18.45.48	3. 2.36	4.861726	10.18.26.25	3.23.41	4.860811
15	9.19.45. 2	3. 4. 9	4.861703	10.19.25.54	3.23.28	4.860776
16	9.20.44.17	3. 5.38	4.861679	10.20.25.25	3.23.11	4.860740
17	9.21.43.32	3. 7. 3	4.861654	10.21.24.56	3.22.50	4.860704
18	9.22.42.48	3. 8.26	4.861628	10.22.24.27	3.22.25	4.860668
19	9.23.42. 4	3. 9.45	4.861602	10.23.23.59	3.21.57	4.860631
20	9.24.41.20	3.11. 1	4.861575	10.24.23.31	3.21.25	4.860594
21	9.25.40.37	3.12.13	4.861548	10.25.23. 4	3.20.50	4.860557
22	9.26.39.55	3.13.22	4.861521	10.26.22.38	3.20.11	4.860520
23	9.27.39.12	3.14.27	4.861492	10.27.22.12	3.19.29	4.860483
24	9.28.38.31	3.15.29	4.861463	10.28.21.46	3.18.42	4.860446
25	9.29.37.50	3.16.28	4.861434	10.29.21.22	3.17.53	4.860408
26	10. 0.37. 9	3.17.23	4.861405	11. 0.20.59	3.16.59	4.860371
27	10. 1.36.29	3.18.15	4.861375	11. 1.20.35	3.16. 2	4.860334
28	10. 2.35.50	3.19. 3	4.861345	11. 2.20.13	3.15. 2	4.860295
29	10. 3.35.10	3.19.47	4.861315	11. 3.19.51	3.13.58	4.860256
30	10. 4.34.31	3.20.28	4.861284	11. 4.19.30	3.12.51	4.860218

VENERIS
Tabula Loci Heliocentrici

Anom. med.	Sig. 2.			Sig. 3		
	Long. ♀ à 1 ✱ ♈	Inc. Au.	Dis. à ☉ Cur	Long. ♀ à 1 ✱ ♈	Inc. Au.	Dis. à ☉ Cur
°	s ° ′ ″	° ′ ″	Logarithm	s ° ′ ″	° ′ ″	Logarithm
0	11. 4.19.30	3.12.51	4.860218	0. 4.13.52	2.14. 1	4.859029
1	11. 5.19. 9	3.11.40	4.860181	0. 5.13.51	2.11.19	4.858988
2	11. 6.18.48	3.10.25	4.860142	0. 6.13.51	2. 8.34	4.858946
3	11. 7.18.29	3. 9. 7	4.860104	0. 7.13.50	2. 5.47	4.858905
4	11. 8.18.10	3. 7.46	4.860065	0. 8.13.52	2. 2.58	4.858864
5	11. 9.17.52	3. 6.21	4.860027	0. 9.13.54	2. 0. 6	4.858823
6	11.10.17.35	3. 4.53	4.859988	0.10.13.56	1.57.12	4.858782
7	11.11.17.18	3. 3.22	4.859949	0.11.13.59	1.54.16	4.858740
8	11.12.17. 2	3. 1.47	4.859910	0.12.14. 3	1.51.18	4.858698
9	11.13.16.46	3. 0. 9	4.859870	0.13.14. 7	1.48.17	4.858657
10	11.14.16.32	2.58.27	4.859831	0.14.14.12	1.45.15	4.858615
11	11.15.16.17	2.56.43	4.859792	0.15.14.18	1.42.11	4.858573
12	11.16.16. 4	2.54.55	4.859753	0.16.14.25	1.39. 4	4.858532
13	11.17.15.51	2.53. 4	4.859713	0.17.14.32	1.35.56	4.858490
14	11.18.15.39	2.51.10	4.859673	0.18.14.40	1.32.46	4.858448
15	11.19.15.27	2.49.12	4.859634	0.19.14.49	1.29.35	4.858406
16	11.20.15.16	2.47.12	4.859594	0.20.14.58	1.26.21	4.858364
17	11.21.15. 6	2.45. 8	4.859554	0.21.15. 8	1.23. 6	4.858321
18	11.22.14.56	2.43. 2	4.859514	0.22.15.18	1.19.50	4.858279
19	11.23.14.47	2.40.52	4.859474	0.23.15.30	1.16.31	4.858236
20	11.24.14.39	2.38.40	4.859434	0.24.15.42	1.13.12	4.858194
21	11.25.14.31	2.36.24	4.859394	0.25.15.55	1. 9.51	4.858152
22	11.26.14.24	2.34. 6	4.859353	0.26.16. 9	1. 6.29	4.858110
23	11.27.14.18	2.31.45	4.859313	0.27.16.24	1. 3. 5	4.858068
24	11.28.14.12	2.29.21	4.859273	0.28.16.39	0.59.40	4.858026
25	11.29.14. 7	2.26.54	4.859232	0.29.16.54	0.56.14	4.857983
26	0. 0.14. 3	2.24.25	4.859192	1. 0.17.10	0.52.47	4.857941
27	0. 1.13.59	2.21.53	4.859151	1. 1.17.27	0.49.19	4.857898
28	0. 2.13.56	2.19.18	4.859110	1. 2.17.45	0.45.50	4.857855
29	0. 3.13.54	2.16.41	4.859070	1. 3.18. 4	0.42.21	4.857813
30	0. 4.13.52	2.14. 1	4.859029	1. 4.18.23	0.38.50	4.857770

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Tabula Loci Heliocentrici.

Anom med.	Sig. 4.			Sig. 5.		
	Long. ♀ à 1 ✱ ♈	Inc. Au.	Dis. à ☉ Cur	Long. ♀ à 1 ✱ ♈	Inc. Bor.	Dis. à ☉ Cur
o	s o ′ ″	o ′ ″	Logarithm.	s o ′ ″	o ′ ″	Logarithm.
0	1. 4.18.23	0.38.50	4.857770	2. 4.33.20	1. 7.28	4.856562
1	1. 5.18.43	0.35.18	4.857728	2. 5.34. 0	1.10.51	4.856526
2	1. 6.19. 4	0.31.46	4.857685	2. 6.34.42	1.14.13	4.856491
3	1. 7.19.25	0.28.13	4.857643	2. 7.35.24	1.17.34	4.856456
4	1. 8.19.48	0.24.40	4.857601	2. 8.36. 5	1.20.53	4.856422
5	1. 9.20.11	0.21. 6	4.857559	2. 9.36.47	1.24.11	4.856388
6	1.10.20.34	0.17.32	4.857516	2.10.37.30	1.27.27	4.856354
7	1.11.20.58	0.13.57	4.857474	2.11.38.13	1.30.42	4.856322
8	1.12.21.22	0.10 22	4.857433	2.12.38.58	1.33.55	4.856290
9	1.13.21.48	0. 6.47	4.857391	2.13.39.43	1.37. 6	4.856259
10	1.14.22.14	0. 3.12	4.857350	2.14.40.28	1.40.15	4.856228
11	1.15.22.41	Bor 0.24	4.857308	2.15.41.14	1.43.23	4.856198
12	1.16.23. 8	0. 3.59	4.857267	2.16.42. 0	1.46.29	4.856169
13	1.17.23.37	0. 7.35	4.857226	2.17.42.47	1.49.32	4.856140
14	1.18.24. 6	0.11.10	4.857185	2.18.43.33	1.52.34	4.856112
15	1.19.24.36	0.14.45	4.857143	2.19.44.20	1.55.33	4.856085
16	1.20.25. 6	0.18.20	4.857103	2.20.45. 8	1.58.31	4.856058
17	1.21.25.37	0.21.55	4.857062	2.21.45.57	2. 1.26	4.856032
18	1.22.26. 9	0.25.29	4.857022	2.22.46.46	2. 4.19	4.856007
19	1.23.26.42	0.29. 3	4.856981	2.23.47.36	2. 7.10	4.855983
20	1.24.27.15	0.32.37	4.856941	2.24.48.25	2. 9.58	4.855960
21	1.25.27.49	0.36. 9	4.856902	2.25.49.15	2.12.43	4.855937
22	1.26.28.23	0.39.41	4.856863	2.26.50. 6	2.15.27	4.855915
23	1.27.28.58	0.43.13	4.856824	2.27.50.57	2.18. 7	4.855894
24	1.28.29.34	0.46.44	4.856786	2.28.51.48	2.20.46	4.855875
25	1.29.30.10	0.50.13	4.856748	2.29.52.39	2.23.21	4.855856
26	2. 0.30.47	0.53.42	4.856709	3. 0.53.30	2.25.54	4.855838
27	2. 1.31.24	0.57.10	4.856672	3. 1.54.22	2.28.24	4.855821
28	2. 2.32. 2	1. 0.37	4.856635	3. 2.55.15	2.30.51	4.855805
29	2. 3.32.41	1. 4. 3	4.856598	3. 3.56. 8	2.33.16	4.855790
30	2. 4.33.20	1. 7.28	4.856562	3. 4.57. 1	2.35.37	4.855776

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Tabula Loci Heliocentrici

Anom. med.	Sig. 6. Long ♀ à 1 ✳ ♈	Sig. 6. Inc. Bor.	Sig. 6. Dis. à ☉ Cur	Sig. 7. Long. ♀ à 1 ✳ ♈	Sig. 7. Inc. Bor.	Sig. 7. Dis. à ☉ Cur
°	s ° ′ ″	° ′ ″	Logarithm	s ° ′ ″	° ′ ″	Logarithm.
0	3. 4.57. 1	2.35.37	4.855776	4. 5.23.45	3.20.59	4.855903
1	3. 5.57.54	2.37.56	4.855763	4. 6.24.35	3.21.34	4.855927
2	3. 6.58.48	2.40.12	4.855751	4. 7.25.25	3.22. 6	4.855952
3	3. 7.59.41	2.42.24	4.855741	4. 8.26.15	3.22.33	4.855978
4	3. 9. 0.35	2.44.34	4.855731	4. 9.27. 4	3.22.57	4.856005
5	3.10. 1.28	2.46.41	4.855722	4.10.27.53	3.23.17	4.856034
6	3.11. 2.22	2.48.44	4.855715	4.11.28.42	3.23.33	4.856064
7	3.12. 3.16	2.50.44	4.855709	4.12.29.30	3.23.46	4.856095
8	3.13. 4.11	2.52.41	4.855704	4.13.30.17	3.23.54	4.856128
9	3.14. 5. 5	2.54.35	4.855700	4.14.31. 3	3.23.59	4.856161
10	3.15. 5.59	2.56.25	4.855698	4.15.31.50	3.24. 0	4.856196
11	3.16. 6.53	2.58.13	4.855696	4.16.32.35	3.23.57	4.856232
12	3.17. 7.48	2.59.56	4.855696	4.17.33.21	3.23.50	4.856270
13	3.18. 8.42	3. 1.37	4.855697	4.18.34. 5	3.23.40	4.856308
14	3.19. 9.37	3. 3.14	4.855699	4.19.34.48	3.23.25	4.856348
15	3.20.10.31	3. 4.47	4.855702	4.20.35.32	3.23. 7	4.856389
16	3.21.11.25	3. 6.17	4.855707	4.21.36.14	3.22.45	4.856431
17	3.22.12.19	3. 7.44	4.855713	4.22.36.55	3.22.20	4.856474
18	3.23.13.13	3. 9. 7	4.855720	4.23.37.37	3.21.50	4.856518
19	3.24.14. 7	3.10.26	4.855728	4.24.38.16	3.21.17	4.856563
20	3.25.15. 0	3.11.42	4.855737	4.25.38.55	3.20.40	4.856610
21	3.26.15.53	3.12.54	4.855748	4.26.39.34	3.19.59	4.856657
22	3.27.16.47	3.14. 3	4.855760	4.27.40.12	3.19.15	4.856705
23	3.28.17.40	3.15. 8	4.855773	4.28.40.48	3.18.27	4.856754
24	3.29.18.33	3.16. 9	4.855788	4.29.41.25	3.17.35	4.856804
25	4. 0.19.25	3.17. 7	4.855804	5. 0.42. 0	3.16.40	4.856856
26	4. 1.20.18	3.18. 1	4.855821	5. 1.42.34	3.15.41	4.856909
27	4. 2.21.10	3.18.51	4.855839	5. 2.43. 8	3.14.38	4.856962
28	4. 3.22. 2	3.19.38	4.855859	5. 3.43.41	3.13.31	4.857016
29	4. 4.22.54	3.20.20	4.855880	5. 4.44.13	3.12.22	4.857071
30	4. 5.23.45	3.20.59	4.855903	5. 5.44.44	3.11. 8	4.857126

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Tabula Loci Heliocentrici.

Anom med.	Sig. 8.			Sig. 9.		
	Long. ♀ à 1 ✳ ♈	Inc. Bor.	Dis. à ☉ Cur	Long. ♀ à 1 ✳ ♈	Inc. Bor.	Dis. à ☉ Cur
o	s o ′ ″	o ′ ″	Logarithm.	s o ′ ″	o ′ ″	Logarithm
0	5. 5.44.44	3.11. 8	4.857126	6. 5.52. 6	2. 9.34	4.859050
1	5. 6.45.13	3. 9.51	4.857183	6. 6.52. 4	2. 6.48	4.859117
2	5. 7.45.42	3. 8.31	4.857241	6. 7.52. 0	2. 4. 0	4.859184
3	5. 8.46.10	3. 7. 7	4.857299	6. 8.51.57	2. 1. 9	4.859251
4	5. 9.46.37	3. 5.39	4.857358	6. 9.51.51	1.58.16	4.859318
5	5.10.47. 3	3. 4. 8	4.857418	6.10.51.44	1.55.21	4.859384
6	5.11.47.28	3. 2.34	4.857478	6.11.51.37	1.52.25	4.859451
7	5.12.47.52	3. 0.57	4.857539	6.12.51.27	1.49.26	4.859517
8	5.13.48.15	2.59.16	4.857600	6.13.51.17	1.46.25	4.859582
9	5.14.48.37	2.57.32	4.857662	6.14.51. 6	1.43.22	4.859648
10	5.15.48.58	2.55.44	4.857725	6.15.50.54	1.40.17	4.859712
11	5.16.49.18	2.53.54	4.857788	6.16.50.41	1.37.11	4.859776
12	5.17.49.37	2.52. 0	4.857852	6.17.50.27	1.34. 3	4.859840
13	5.18.49.54	2.50. 3	4.857917	6.18.50.12	1.30.53	4.859903
14	5.19.50.11	2.48. 3	4.857982	6.19.49.56	1.27.42	4.859966
15	5.20.50.26	2.46. 0	4.858047	6.20.49.38	1.24.29	4.860029
16	5.21.50.41	2.43.53	4.858112	6.21.49.19	1.21.15	4.860091
17	5.22.50.54	2.41.44	4.858178	6.22.49. 0	1.17.59	4.860152
18	5.23.51. 6	2.39.32	4.858244	6.23.48.40	1.14.42	4.860212
19	5.24.51.18	2.37.17	4.858310	6.24.48.19	1.11.23	4.860272
20	5.25.51.28	2.34.59	4.858377	6.25.47.56	1. 8. 4	4.860331
21	5.26.51.37	2.32.39	4.858444	6.26.47.34	1. 4.43	4.860390
22	5.27.51.44	2.30.15	4.858511	6.27.47.10	1. 1.21	4.860448
23	5.28.51.50	2.27.49	4.858578	6.28.46.44	0.57.58	4.860505
24	5.29.51.57	2.25.20	4.858646	6.29.46.18	0.54.34	4.860561
25	6. 0.52. 1	2.22.49	4.858713	7. 0.45.50	0.51. 9	4.860617
26	6. 1.52. 4	2.20.15	4.858780	7. 1.45.22	0.47.43	4.860671
27	6. 2.52. 7	2.17.38	4.858848	7. 2.44.54	0.44.16	4.860725
28	6. 3.52. 7	2.14.59	4.858915	7. 3.44.24	0.40.49	4.860778
29	6. 4.52. 7	2.12.18	4.858983	7. 4.43.53	0.37.20	4.860830
30	6. 5.52. 6	2. 9.34	4.859050	7. 5.43.21	0.33.52	4.860881

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Tabula Loci Heliocentrici.

Anom med	Sig.10.			Sig.11.		
	Long. ♀ à 1 ✶ ♈.	Inc. Bor.	Dis. à ☉ Cur	Long. ♀ à 1 ✶ ♈.	Inc. Au.	Dis. á ☉ Cur
0	s ° ′ ″	° ′ ″	Logarithm.	s ° ′ ″	° ′ ″	Logarithm
0	7. 5.43.21	0.33.52	4.860881	8. 5.22.25	1.10.12	4.861932
1	7. 6.42.49	0.30.22	4.860931	8. 6.21.36	1.13.30	4.861950
2	7. 7.42.16	0.26.53	4.860981	8. 7.20.47	1.16.46	4.861966
3	7. 8.41.42	0.23.22	4.861030	8. 8.19.57	1.20. 0	4.861981
4	7. 9.41. 7	0.19.52	4.861077	8. 9.19. 7	1.23.13	4.861995
5	7.10.40.32	0.16.21	4.861123	8.10.18.17	1.26.25	4.862007
6	7.11.39.56	0.12.50	4.861169	8.11.17.26	1.29.35	4.862019
7	7.12.39.15	0. 9.18	4.861213	8.12.16.36	1.32.44	4.862029
8	7.13.38.41	0. 5.47	4.861256	8.13.15.45	1.35.51	4.862039
9	7.14.38. 2	0. 2.15	4.861299	8.14.14.54	1.38.56	4.862048
10	7.15.37.24	Au 1.16	4.861340	8.15.14. 3	1.41.59	4.862055
11	7.16.36.44	0. 4.48	4.861380	8.16.13.12	1.45. 1	4.862061
12	7.17.36. 3	0. 8.19	4.861420	8.17.12.20	1.48. 1	4.862067
13	7.18.35.22	0.11.50	4.861458	8.18.11.29	1.50.58	4.862071
14	7.19.34.41	0.15.21	4.861495	8.19.10.38	1.53.54	4.862074
15	7.20.33.58	0.18.52	4.861530	8.20. 9.46	1.56.48	4.862075
16	7.21.33.15	0.22.22	4.861565	8.21. 8.54	1.59.40	4.862076
17	7.22.32.32	0.25.52	4.861599	8.22. 8. 3	2. 2.29	4.862076
18	7.23.31.48	0.29.21	4.861631	8.23. 7.12	2. 5.16	4.862075
19	7.24.31. 3	0.32.50	4.861663	8.24. 6.20	2. 8. 2	4.862072
20	7.25.30.18	0.36.18	4.861693	8.25. 5.28	2.10.44	4.862069
21	7.26.29.33	0.39.46	4.861722	8.26. 4.37	2.13.25	4.862064
22	7.27.28.47	0.43.12	4.861750	8.27. 3.46	2.16. 3	4.862059
23	7.28.28. 2	0.46.38	4.861777	8.28. 2.55	2.18.39	4.862054
24	7.29.27.15	0.50. 3	4.861802	8.29. 2. 4	2.21.12	4.862047
25	8. 0.26.27	0.53.27	4.861827	9. 0. 1.13	2.23.43	4.862038
26	8. 1.25.40	0.56.51	4.861851	9. 1. 0.22	2.26.11	4.862029
27	8. 2.24.51	1. 0.13	4.861873	9. 1.59.32	2.28.37	4.862019
28	8. 3.24. 3	1. 3.34	4.861894	9. 2.58.41	2.31. 0	4.862009
29	8. 4.23.14	1. 6.54	4.861914	9. 3.57.51	2.33.20	4.861997
30	8. 5.22.25	1.10.12	4.861932	9. 4.57. 1	2.35.37	4.861985

MERCURII

Tabula Motus Medij ab Aphelio.

Ann. Chr. Cur.	Anomalia ☿ s ° ′ ″
1.	3· 1·32· 0
1501	3· 9· 2· 0
1581	5· 7· 2· 0
1601	5·21·32· 0
1621	6· 6· 2· 0
1641	6.20 32. 0
1661	7· 5· 2· 0
1681	7·19·32· 0
1701	8· 4· 2· 0
1721	8 18.32· 0
1741	9· 3· 2· 0
1761	9·17·32· 0
1781	10· 2· 2· 0
1801	10·16·32. 0
1901	0 29· 2· 0
2001	3·11·32 0

An. nis.	Mot. anom. s ° ′ ″
20	0·14·30· 0
40	0·29· 0. 0
60	1·13·30· 0
80	1·28· 0· 0
100	2.12.30· 0
200	4·25· 0· 0
300	7· 7·30· 0
400	9·20· 0· 0
500	0. 2·30· 0
600	2.15· 0· 0
700	4·27·30. 0
800	7·10· 0 0
900	9·22·30· 0
1000	0· 5· 0· 0
2000	0·10· 0. 0
3000	0.15 0· 0
4000	0·20· 0· 0
5000	0·25· 0. 0
6000	1. 0· 0· 0

An- nis.	Mot. anom. s ° ′ ″
1	1·23·42· 7
2	3 17·24·14
3	5·11· 6·21
4	7· 8·54· 0
5	9· 2·36· 7
6	10.26 18·14
7	0·20 0·21
8	2·17 48. 0
9	4·11·30· 7
10	6. 5·12.14
11	7·28.54·21
12	9·26·42· 0
13	11.20·24· 7
14	1·14· 6 14
15	3· 7·48.21
16	5· 5·36· 0
17	6.29·18· 7
18	8·23· 0·14
19	10·16·42·21
20	0·14·30. 0

Menſ. A.Cō	Mot. anom. s ° ′ ″
Janua.	0· 0· 0· 0
Febr.	4· 6·51·44
Mart.	8. 1·26·52
April.	0· 8·18·36
Maij.	4 11· 4·48
Junij.	8·17·56·33
Julij.	0·20·42·45
Aug.	4·27·34·29
Sept.	9· 4·26·14
Octo.	1· 7·12·26
Nov.	5·14· 4.10
Decē.	9·16·50.22

In anno Biſſextili, poſt Februarium, adde unum diem & unius diei motum.

Dies.	Mot. anom. s ° ′ ″
1	0. 4· 5·32
2	0. 8.11· 5
3	0.12.16·37
4	0.16 22.10
5	0.20.27·42
6	0.24.33·14
7	0.28.38·47
8	1. 2.44 19
9	1. 6.49.52
10	1.10.55·24
11	1.15. 0·56
12	1.19. 6·29
13	1.23.12· 1
14	1.27.17·34
15	2. 1·23. 6
16	2. 5.28·38
17	2. 9.34·11
18	2.13.39 43
19	2.17.45·16
20	2.21.50·48
21	2.25.56·20
22	3· 0. 1·53
23	3. 4· 7·25
24	3. 8.12·58
25	3.12.18·30
26	3.16.24· 2
27	3.20.29·35
28	3·24·35· 7
29	3 28.40.40
30	4· 2·46.12
31	4. 6.51·44
32	4.10.57·17

Hor. ′	Mot.anom ° ′ ″ / ′ ″ ‴	H. ′	Mot.anom ° ′ ″ / ′ ″ ‴
1	0·10.14	31	5·17· 9
2	0·20·28	32	5·27· 23
3	0·30·42	33	5·37· 37
4	0·40·55	34	5·47· 51
5	0·51· 9	35	5·58· 5
6	1. 1·23	36	6. 8. 19
7	1·11·37	37	6·18· 32
8	1·21·51	38	6 28· 46
9	1 32· 5	39	6·39· 0
10	1·42·18	40	6·49· 14
11	1·52·32	41	6·59· 28
12	2. 2.46	42	7· 9·42
13	2 13· 0	43	7·19· 56
14	2·23 14	44	7·30· 9
15	2·33·28	45	7·40· 23
16	2·43·42	46	7·50 37
17	2·53·55	47	8· 0 51
18	3· 4· 9	48	8·11· 5
19	3·14·23	49	8·21· 19
20	3·24·37	50	8·31· 32
21	3·34·51	51	8·41· 46
22	3·45· 5	52	8·52. 0
23	3 55·19	53	9· 2· 14
24	4· 5·32	54	9·12· 28
25	4·15·46	55	9·22· 42
26	4·26. 0	56	9·32· 56
27	4·36.14	57	9·43· 9
28	4·46·28	58	9·53· 23
29	4 56·42	59	10· 3· 37
30	5· 6·55	60	10·13· 51

		s	°	′	″
Long. Aphel. ☿ à 1 ✱ ♈		7·	13.	48.	0.
Long. ☊ ☿ à 1 ✱ ♈		0·	15.	42.	0.
In li. Orb. ☿			6.	54·	0.

Diſt. med. ☿ à ☉ — 38710

Eccentricitas — 7970

MERCURII
Tabula Loci Heliocentrici.

Anom. med.	Sig. 0.			Sig. 1.		
	Long. ☿ à 1 ✱ ♈	Inc. Au.	Dis à ☉ Cur	Long. ☿ à 1 ✱ ♈	Inc. Au.	Dis à ☉ Cur
°	s ° ′ ″	° ′ ″	Logarithm.	s ° ′ ″	° ′ ″	Logarithm
0	7.13.37.38	3.14.38	4.668435	8. 3.58.36	5. 9.40	4.660373
1	7.14.17.50	3.18.54	4.668395	8. 4.40.16	5.12.58	4.659860
2	7.14.58. 4	3.23. 9	4.668340	8. 5.22. 1	5.16.14	4.659332
3	7.15.38.18	3.27.22	4.668269	8. 6. 3.51	5.19.27	4.658789
4	7.16.18.34	3.31.34	4.668184	8. 6.45.47	5.22.38	4.658231
5	7.16.58.49	3.35.43	4.668082	8. 7.27.50	5.25.47	4.657656
6	7.17.39. 6	3.39.51	4.667963	8. 8. 9.56	5.28.53	4.657066
7	7.18.19.24	3.43.58	4.667829	8. 8.52.15	5.31.57	4.656459
8	7.18.59.45	3.48. 2	4.667678	8. 9.34.37	5.34.58	4.655838
9	7.19.40. 6	3.52. 5	4.667512	8.10.17. 6	5.37.57	4.655201
10	7.20.20.29	3.56. 6	4.667330	8.10.59.41	5.40.53	4.654549
11	7.21. 0.54	4. 0. 6	4.667132	8.11.42.24	5.43.46	4.653882
12	7.21.41.21	4. 4. 3	4.666918	8.12.25.15	5.46.37	4.653199
13	7.22.21.51	4. 7.59	4.666687	8.13. 8.15	5.49.25	4.652500
14	7.23. 2.23	4.11.53	4.666441	8.13.51.22	5.52.10	4.651787
15	7.23.42.58	4.15.45	4.666180	8.14.34.37	5.54.52	4.651059
16	7.24.23.35	4.19.34	4.665904	8.15.18. 1	5.57.31	4.650314
17	7.25. 4.14	4.23.22	4.665610	8.16. 1.33	6. 0. 8	4.649555
18	7.25.44.58	4.27. 9	4.665301	8.16.45.14	6. 2.41	4.648780
19	7.26.25.44	4.30.53	4.664976	8.17.29. 4	6. 5.12	4.647989
20	7.27. 6.34	4.34.35	4.664636	8.18.13. 4	6. 7.40	4.647183
21	7.27.47.27	4.38.15	4.664280	8.18.57.15	6.10. 4	4.646363
22	7.28.28.25	4.41.53	4.663908	8.19.41.35	6.12.25	4.645526
23	7.29. 9.26	4.45.29	4.663522	8.20.26. 5	6.14.44	4.644674
24	7.29.50.31	4.49. 3	4.663119	8.21.10.45	6.16.58	4.643808
25	8. 0.31.40	4.52.34	4.662700	8.21.55.36	6.19.10	4.642925
26	8. 1.12.54	4.56. 4	4.662266	8.22.40.37	6.21.18	4.642028
27	8. 1.54.12	4.59.31	4.661817	8.23.25.50	6.23.23	4.641115
28	8. 2.35.35	5. 2.56	4.661351	8.24.11.14	6.25.25	4.640187
29	8. 3.17. 3	5. 6.19	4.660870	8.24.56.51	6.27.22	4.639244
30	8. 3.58.36	5. 9.40	4.660373	8.25.42.39	6.29.17	4.638286

MERCURII
Tabula Loci Heliocentrici.

Anom med.	Sig. 2. Long. ☿ à 1 ✱ ♈	Sig. 2. Inc. Au.	Sig. 2. Dis. à ☉ Cur.	Sig. 3. Long. ☿ à 1 ✱ ♈	Sig. 3. Inc. Au.	Sig. 3. Dis. à ☉ Cur.
o	s o ′ ″	o ′ ″	Logarithm.	s o ′ ″	o ′ ″	Logarithm.
0	8.25.42.39	6.29.17	4.638286	9.20.34. 1	6.52.31	4.602718
1	8.26.28.39	6.31. 7	4.637312	9.21.28.31	6.51.55	4.601318
2	8.27.14.51	6.32.54	4.636323	9.22.23.25	6.51.12	4.599905
3	8.28. 1.17	6.34.37	4.635320	9.23.18.40	6.50.23	4.598478
4	8.28.47.57	6.36.17	4.634303	9.24.14.18	6.49.27	4.597040
5	8.29.34.49	6.37.52	4.633270	9.25.10.20	6.48.25	4.595590
6	9. 0.21.54	6.39.24	4.632221	9.26. 6.45	6.47.15	4.594129
7	9. 1. 9.14	6.40.51	4.631158	9.27. 3.34	6.45.58	4.592655
8	9. 1.56.48	6.42.14	4.630081	9.28. 0.47	6.44.34	4.591170
9	9. 2.44.37	6.43.33	4.628988	9.28.58.26	6.43. 2	4.589674
10	9. 3.32.40	6.44.48	4.627880	9.29.56.30	6.41.24	4.588166
11	9. 4.21. 0	6.45.59	4.626757	10. 0.54.59	6.39.37	4.586648
12	9. 5. 9.33	6.47. 5	4.625620	10. 1.53.54	6.37.43	4.585119
13	9. 5.58.22	6.48. 6	4.624469	10. 2.53.14	6.35.41	4.583581
14	9. 6.47.29	6.49. 3	4.623302	10. 3.53. 1	6.33.31	4.582034
15	9. 7.36.51	6.49.55	4.622121	10. 4.53.16	6.31.12	4.580478
16	9. 8.26.30	6.50.43	4.620926	10. 5.53.56	6.28.46	4.578912
17	9. 9.16.26	6.51.25	4.619717	10. 6.55. 5	6.26.11	4.577338
18	9.10. 6.39	6.52. 3	4.618492	10. 7.56.42	6.23.27	4.575755
19	9.10.57.10	6.52.36	4.617253	10. 8.58.46	6.20.35	4.574164
20	9.11.48. 0	6.53. 3	4.616001	10.10. 1.19	6.17.34	4.572565
21	9.12.39. 7	6.53.25	4.614734	10.11. 4.21	6.14.24	4.570960
22	9.13.30.34	6.53.42	4.613454	10.12. 7.53	6.11. 5	4.569348
23	9.14.22.20	6.53.53	4.612159	10.13.11.54	6. 7.36	4.567730
24	9.15.14.24	6 53.59	4.610851	10.14.16.24	6. 3.59	4.566107
25	9.16. 6.49	6.53.59	4.609529	10.15.21.24	6. 0.12	4.564479
26	9.16.59.33	6.53.54	4.608194	10.16.26.54	5.56.15	4.562845
27	9.17.52.38	6.53.42	4.606845	10.17.32.55	5.52. 9	4.561207
28	9.18.46. 5	6.53.25	4.605482	10.18.39.27	5.47.52	4.559567
29	9.19.39.52	6.53. 1	4.604107	10.19.46.30	5.43.26	4.557924
30	9.20.34. 1	6.52.31	4,602718	10.20.54. 4	5.38.50	4.556279

MERCURII
Tabula Loci Heliocentrici

Anom med.	Sig. 4.			Sig. 5		
	Long. ☿ à 1 ✱ ♈	Inc. Au.	Dis. à ☉ Cur	Long. ☿ à 1 ✱ ♈	Inc. Au.	Dis. à ☉ Cur
°	s ° ′ ″	° ′ ″	Logarithm	s ° ′ ″	° ′ ″	Logarithm.
0	10.20.54. 4	5.38.50	4.556279	11.28.52.50	2. 0.20	4.509752
1	10.22. 2.10	5.34. 4	4.554631	0. 0.17. 0	1.50.33	4.508451
2	10.23.10.48	5.29. 7	4.552984	0. 1.41.39	1.40.39	4.507179
3	10.24.19.58	5.24. 1	4.551335	0. 3. 6.47	1.30.38	4.505935
4	10.25.29.39	5.18.44	4.549687	0. 4.32.22	1.20.31	4.504721
5	10.26.39.53	5.13.16	4.548040	0. 5.58.25	1.10.16	4.503537
6	10.27.50.40	5. 7.38	4.546395	0. 7.24.54	0.59.56	4.502386
7	10.29. 1.58	5. 1.49	4.544752	0. 8.51.49	0.49.31	4.501268
8	11. 0.13.49	4.55.50	4.543114	0.10.19. 9	0.39. 1	4.500185
9	11. 1.26.14	4.49.40	4.541479	0.11.46.55	0.28.26	4.499137
10	11. 2.39.12	4.43.19	4.539849	0.13.15. 3	0.17.47	4.498126
11	11. 3.52.42	4.36.48	4.538226	0.14.43.35	0. 7. 4	4.497152
12	11. 5. 6.46	4.30. 6	4.536608	0.16.12.30	Bor 3.41	4.496217
13	11. 6.21.23	4.23.13	4.534999	0.17.41.45	0.14.29	4.495321
14	11. 7.36.32	4.16.10	4.533397	0.19.11.21	0.25.19	4.494467
15	11. 8.52.15	4. 8.56	4.531805	0.20.41.16	0.36.10	4.493655
16	11.10. 8.31	4. 1.31	4.530225	0.22.11.30	0.47. 2	4.492885
17	11.11.25.20	3.53.56	4.528655	0.23.42. 2	0.57.54	4.492158
18	11.12.42.42	3.46.11	4.527097	0.25.12.50	1. 8.45	4.491476
19	11.14. 0.38	3.38.15	4.525553	0.26.43.54	1.19.35	4.490840
20	11.15.19. 5	3.30. 8	4.524023	0.28.15.13	1.30.24	4.490248
21	11.16.38. 5	3.21.52	4.522509	0.29.46.45	1.41.10	4.489702
22	11.17.57.38	3.13.26	4.521011	1. 1.18.30	1.51.54	4.489204
23	11.19.17.42	3. 4.50	4.519531	1. 2.50.26	2. 2.33	4.488755
24	11.20.38.18	2.56. 4	4.518069	1. 4.22.32	2.13. 9	4.488354
25	11.21.59.26	2.47. 9	4.516626	1. 5.54.47	2.23.39	4.488003
26	11.23.21. 5	2.38. 4	4.515205	1. 7.27.10	2.34. 4	4.487702
27	11.24.43.16	2.28.51	4.513806	1. 8.59.41	2.44.23	4.487451
28	11.26. 5.58	2.19.29	4.512430	1.10.32.16	2.54.36	4.487252
29	11.27.29. 9	2. 9.58	4.511079	1.12. 4.55	3. 4.41	4.487104
30	11.28.52.50	2. 0.20	4.509752	1.13.37.38	3.14.38	4.487008

MERCURII
Tabula Loci Heliocentrici.

Anom med.	Sig. 6.			Sig. 7.		
	Long. ☿ à 1 ✳ ♈	Inc. Bor.	Dis. à ☉ Cur	Long. ☿ à 1 ✳ ♈	Inc. Bor.	Dis. à ☉ Cur
°	s ° ′ ″	° ′ ″	Logarithm.	s ° ′ ″	° ′ ″	Logarithm.
0	1.13.37.38	3.14.38	4.487008	2.28.43.10	6.36. 7	4.507129
1	1.15.10.23	3.24.27	4.486962	3. 0. 7.52	6.38.57	4.508458
2	1.16.43. 8	3.34. 7	4.486969	3. 1.32. 3	6.41.32	4.509819
3	1.18.15.52	3.43.36	4.487029	3. 2.55.46	6.43.51	4.511209
4	1.19.48.35	3.52.56	4.487140	3. 4.18.56	6.45.56	4.512629
5	1.21.21.14	4. 2. 5	4.487304	3. 5.41.33	6.47.46	4.514078
6	1.22.53.48	4.11. 3	4.487521	3. 7. 3.38	6.49.21	4.515553
7	1.24.26.17	4.19.50	4.487789	3. 8.25. 9	6.50.42	4.517052
8	1.25.58.40	4.28.24	4.488109	3. 9.46. 9	6.51.48	4.518576
9	1.27.30.55	4.36.46	4.488481	3.11. 6.34	6.52.41	4.520121
10	1.29. 3. 0	4.44.55	4.488905	3.12.26.25	6.53.20	4.521688
11	2. 0.34.53	4.52.51	4.489378	3.13.45.44	6.53.46	4.523276
12	2. 2. 6.36	5. 0.33	4.489901	3.15. 4.28	6.53.59	4.524882
13	2. 3.38. 6	5. 8. 1	4.490474	3.16.22.36	6.53.58	4.526505
14	2. 5. 9.21	5.15.15	4.491097	3.17.40.10	6.53.45	4.528144
15	2. 6.40.21	5.22.14	4.491768	3.18.57.10	6.53.20	4.529798
16	2. 8.11. 5	5.28.58	4.492488	3.20.13.35	6.52.43	4.531467
17	2. 9.41.32	5.35.27	4.493254	3.21.29.23	6.51.54	4.533148
18	2.11.11.38	5.41.42	4.494068	3.22.44.37	6.50.54	4.534841
19	2.12.41.26	5.47.40	4.494928	3.23.59.16	6.49.43	4.536543
20	2.14.10.54	5.53.23	4.495833	3.25.13.19	6.48.21	4.538255
21	2.15.40. 0	5.58.51	4.496782	3.26.26.48	6.46.48	4.539975
22	2.17. 8.43	6. 4. 3	4.497773	3.27.39.42	6.45. 6	4.541702
23	2.18.37. 2	6. 8.58	4.498807	3.28.52. 1	6.43.13	4.543434
24	2.20. 4.58	6.13.38	4.499882	4. 0. 3.45	6.41.11	4.545172
25	2.21.32.28	6.18. 2	4.500997	4. 1.14.55	6.38.59	4.546914
26	2.22.59.32	6.22.11	4.502151	4. 2.25.30	6.36.39	4.548659
27	2.24.26. 8	6.26. 3	4.503342	4. 3.35.30	6.34. 9	4.550406
28	2.25.52.17	6.29.40	4.504569	4. 4.44.56	6.31.32	4.552154
29	2.27.17.57	6.33. 1	4.505832	4. 5.53.48	6.28.46	4.553902
30	2.28.43.10	6.36. 7	4.507129	4. 7. 2. 8	6.25.52	4.55565[illegible]

MERCURII
Tabula Loci Heliocentrici

Anom. med.	Sig. 8. Long. ☿ à 1 ✶ ♈	Sig. 8. Inc. Bor.	Sig. 8. Dis. à ☉ Cur	Sig. 9 Long. ☿ à 1 ✶ ♈	Sig. 9 Inc. Bor.	Sig. 9 Dis. à ☉ Cur
°	s ° ′ ″	° ′ ″	Logarithm	s ° ′ ″	° ′ ″	Logarithm.
0	4. 7. 2. 8	6.25.52	4.555650	5. 7.16.16	4.18. 5	4.604628
1	4. 8. 9.53	6.22.51	4.557396	5. 8. 9.56	4.13. 0	4.606072
2	4. 9.17. 4	6.19.43	4.559139	5. 9. 3.14	4. 7.53	4.607500
3	4.10.23.44	6.16.27	4.560881	5. 9.56.10	4. 2.44	4.608914
4	4.11.29.49	6.13. 5	4.562618	5.10.48.45	3.57.34	4.610311
5	4.12.35.23	6. 9.36	4.564352	5.11.40.58	3.52.23	4.611693
6	4.13.40.25	6. 6. 1	4.566080	5.12.32.51	3.47.10	4.613059
7	4.14.44.54	6. 2.20	4.567801	5.13.24.24	3.41.57	4.614408
8	4.15.48.52	5.58.33	4.569516	5.14.15.38	3.36.42	4.615743
9	4.16.52.21	5.54.41	4.571225	5.15. 6.31	3.31.27	4.617060
10	4.17.55.17	5.50.43	4.572926	5.15.57. 6	3.26.10	4.618362
11	4.18.57.44	5.46.41	4.574619	5.16.47.23	3.20.53	4.619647
12	4.19.59.39	5.42.33	4.576302	5.17.37.21	3.15.36	4.620916
13	4.21. 1. 5	5.38.21	4.577977	5.18.27. 0	3.10.17	4.622168
14	4.22. 2. 2	5.34. 4	4.579641	5.19.16.22	3. 4.58	4.623404
15	4.23. 2.30	5.29.44	4.581295	5.20. 5.27	2.59.39	4.624623
16	4.24. 2.31	5.25.19	4.582939	5.20.54.15	2.54.19	4.625825
17	4.25. 2. 3	5.20.50	4.584570	5.21.42.47	2.48.59	4.627011
18	4.26. 1. 5	5.16.18	4.586191	5.22.31. 3	2.43.39	4.628180
19	4.26.59.42	5.11.42	4.587801	5.23.19. 3	2.38.18	4.629332
20	4.27.57.52	5. 7. 3	4.589398	5.24. 6.48	2.32.57	4.630468
21	4.28.55.35	5. 2.21	4.590983	5.24.54.17	2.27.36	4.631587
22	4.29.52.52	4.57.36	4.592555	5.25.41.31	2.22.16	4.632688
23	5. 0.49.44	4.52.48	4.594113	5.26.28.31	2.16.55	4.633772
24	5. 1.46. 9	4.47.57	4.595658	5.27.15.17	2.11.34	4.634841
25	5. 2.42. 9	4.43. 4	4.597188	5.28. 1.48	2. 6.13	4.635892
26	5. 3.37.47	4.38. 8	4.598705	5.28.48. 6	2. 0.52	4.636927
27	5. 4.32.59	4.33.10	4.600207	5.29.34.12	1.55.32	4.637943
28	5. 5.27.48	4.28.11	4.601696	6. 0.20. 4	1.50.12	4.638943
29	5. 6.22.14	4.23. 9	4.603169	6. 1. 5.43	1.44.52	4.639927
30	5. 7.16.16	4.18. 5	4.604628	6. 1.51.11	1.39.32	4.640894

MERCURII
Tabula Loci Heliocentrici.

Anom med.	Sig. 10.			Sig. 11.		
	Long. ☿ à 1 ✶ ♈	Inc. Bor.	Dis. à ☉ Cur	Long. ☿ à 1 ✶ ♈	Inc. Au.	Dis. à ☉ Cur
°	s ° ′ ″	° ′ ″	Logarithm.	s ° ′ ″	° ′ ″	Logarithm
0	6. 1.51.11	1.39.32	4.640894	6.23.21.40	0.55.27	4.662081
1	6. 2.36.26	1.34.13	4.641844	6.24. 2.54	1. 0.24	4.662529
2	6. 3.21.30	1.28.54	4.642777	6.24.44. 4	1. 5.19	4.662961
3	6. 4. 6.22	1.23.35	4.643693	6.25.25. 9	1.10.13	4.663376
4	6. 4.51. 3	1.18.17	4.644592	6.26. 6.10	1.15. 6	4.663775
5	6. 5.35.33	1.13. 0	4.645474	6.26.47. 6	1.19.58	4.664157
6	6. 6.19.53	1. 7.43	4.646340	6.27.28. 0	1.24.49	4.664524
7	6. 7. 4. 1	1. 2.26	4.647188	6.28. 8.49	1.29.39	4.664873
8	6. 7.48. 0	0.57.10	4.648019	6.28.49.35	1.34.27	4.665206
9	6. 8.31.50	0.51.55	4.648834	6.29.30.18	1.39.14	4.665523
10	6. 9.15.31	0.46.40	4.649632	7. 0.10.58	1.44. 0	4.665824
11	6. 9.59. 1	0.41.26	4.650412	7. 0.51.34	1.48.45	4.666109
12	6.10.42.23	0.36.13	4.651177	7. 1.32. 8	1.53.29	4.666377
13	6.11.25.35	0.31. 0	4.651924	7. 2.12.40	1.58.11	4.666629
14	6.12. 8.39	0.25.48	4.652655	7. 2.53. 8	2. 2.52	4.666865
15	6.12.51.35	0.20.37	4.653369	7. 3.33.34	2. 7.32	4.667084
16	6.13.34.23	0.15.26	4.654066	7. 4.13.59	2.12.10	4.667287
17	6.14.17. 3	0.10.17	4.654745	7. 4.54.22	2.16.47	4.667474
18	6.14.59.36	0. 5. 8	4.655410	7. 5.34.44	2.21.23	4.667646
19	6.15.42. 2	Au. 0	4.656057	7. 6.15. 4	2.25.57	4.667800
20	6.16.24.20	0. 5. 7	4.656688	7. 6.55.21	2.30.30	4.667939
21	6.17. 6.30	0.10.13	4.657301	7. 7.35.37	2.35. 1	4.668060
22	6.17.48.35	0.15.19	4.657899	7. 8.15.53	2.39.31	4.668166
23	6.18.30.33	0.20.23	4.658479	7. 8.56. 9	2.44. 0	4.668257
24	6.19.12.26	0.25.27	4.659044	7. 9.36.22	2.48.27	4.668330
25	6.19.54.12	0.30.29	4.659592	7.10.16.35	2.52.53	4.668388
26	6.20.35.52	0.35.31	4.660123	7.10.56.48	2.57.17	4.668429
27	6.21.17.27	0.40.32	4.660637	7.11.37. 1	3. 1.39	4.668453
28	6.21.58.56	0.45.31	4.661134	7.12.17.13	3. 6. 0	4.668463
29	6.22.40.20	0.50.30	4.661615	7.12.57.26	3.10.20	4.668456
30	6.23.21.40	0.55.27	4.662081	7.13.37.38	3.14.38	4.668435

Catalogus Quarundam Fixarum.

Huic Longitudini stellarum adde Praecessionem Aequinoctii et h^r verum Longitud
praecessio Aeq. ad annum 1671 est 0. 28.32' addenda

Stellarum Nomina.	*Longitudo.* s ° '	*Latitudo.* ° '	*Mag*
Australis in præcedente cornu ♈ prima	0. 0. 0	7. 8.ſ.B	4
Borealis ſequens in eodem cornu	0. 0.46	8.29. B	4
Lucida cathedræ Caſſiopeæ	0. 1.58ſ.	51.14. B	3
Ceti præcedens trium in gena	0. 4.25	14.32. A	3
Lucida in vertice ♈	0. 4.29	9.57. B	3
Schedir Caſſiopeæ	0. 4.40ſ.	46.35. B	3
Medium oris Ceti	0. 6.16ſ.	12. 2.ſ A	3
In flexura Caſſiopeæ	0.10.50ſ.	48.46. B	3
Auſtralis pes Andromedæ	0.11. 2	27.46.ſ. B	2
Lucida mandibulæ Ceti	0.11.10	12.37. A	2
Genu Caſſiopeæ	0.14.44	46.22. B	3
Caput Meduſæ	0.23. 0	22.22. B	3
Lucida Pleiadum	0.26.47	4. 0. B	3
Lucidum latus Perſei	0.28.40	30. 5. B	2
Prima Hyadum	1. 2.35	5.46.ſ.A	3
Inter hanc & oculum boreum ♉	1. 3.39ſ.	4. 2. A	3
Oculus boreus ♉	1. 5.16	2.36.ſ.A	3
Auſtrinus oculus, Aldebaran	1. 6.35ſ	5.31. A	1
Lucidus pes Orionis, Rigel	1.13.40	31.11. A	1
In femore Leporis	1.16.29ſ.	43.57. A	3
Præcedens humerus Orionis	1.17.46	16.53. A	2
Capella, Hircus	1.18.39	22.50.ſ.B	1
Prima balthei Orionis	1.19.13ſ.	23.38. A	2
In extremitate cornu borei ♉	1.19.22ſ.	5.20. B	2
Media balthei Orionis	1.20.17	24.33.ſ.A	2
Ultima balthei Orionis	1.21.29ſ.	25.21.ſ.A	2
In extremitate cornu auſtralis ♉	1.21.35	2.14. A	3
Ultima caudæ Urſæ minoris, Polaris	1.25.25ſ.	66. 2. B	2
Sequens humerus Orionis	1.25.35	16. 6. A	2
Propus	1.27.45	0.13. A	4
Dexter humerus Aurigæ	1.28.15	21.27.ſ. B	2
Præcedentis ♊ pes prior	2. 0.16	0.58. A	4

Catalogus Quarundam Fixarum.

Stellarum Nomina.	*Longitudo.* s ° ′	*Latitudo.* ° ′	*Mag*
Sequens in eodem pede, Calx	2. 2.7	0.53. A	3
In extremo pedis prioris Canis	2. 4.5 ſ.	41.18.ſ.A	2
Lucida pedis ♊	2. 5.54	6.48.ſ.A	2
In boreali genu ♊	2. 6.45	2.11. B	3
Canis Major, Sirius	2.10.58ſ.	39.30. A	1
In ſiniſtro genu ſequentis ♊	2.11.49	2. 6.ſ.A	3
In Ventre ſequentis ♊	2.15.19	0.13.ſ A	3
Superioris caput ♊ *Caſtor*	2.17. 4	10. 2. B	2
Inferioris Caput ♊ *Pollux*	2.20. 6	6.38. B	2
Canis Minor, Procyon	2.22.41ſ.	15.57. A	2
In radice caudæ ♋	2.28. 8ſ.	2.28.ſ.A	4
Præſepe, pectus ♋	3. 4. 9ſ.	1.14. B	*neb*
Aſellus boreus	3. 4.20	3. 8. B	4
Aſellus auſtralis	3. 5.31	0. 4. B	4
Brachium auſtrinum ♋	3.10.26ſ.	5. 8. A	3
Superior præcedentium in □ *Urſæ Majoris*	3.11.57	49.40. B	2
Inferior ejuſdem □	3.16. 6ſ.	45. 3.ſ. B	2
In Capite ♌ *auſtralior*	3.17.28	9.40. B	3
Antecedens Regulum proximè	3.24. 6ſ.	0. 0.ſ.B	4
Cor Hydræ	3.24. 8ſ.	22.24. A	1
Trium in collo ♌ *borea*	3.24.20ſ.	11.50. B	3
Auſtralis colli ♌	3.24.43	4.52. B	3
Media & Lucida colli ♌	3.26.22	8.47. B	2
Leonis Cor, Regulus	3.26.40	0.26.ſ.B	1
Inferior ſequentium □ *Urſæ Majoris*	3.27. 8	47. 6.ſ.B	2
Superior ejuſdem	3.27.48ſ.	51.37. B	2
Tertia ab extrema in cauda Draconis	4. 4.33ſ.	66.36. B	2
Radix caudæ Urſæ Majoris	4. 5.33	54.18. B	2
Lucida lumbi ſive tergum ♌	4. 8. 4	14.20. B	2
In clune ♌	4.10.13	9.41.ſ.B	3
Penultima caudæ Urſæ Majoris	4.12.19ſ.	56.22. B	2
In femore ♌	4.14.21ſ.	6. 7. B	3

Catalogus Quarundam Fixarum.

Long' hic scriptæ add. præcessionem Aequin. et hr distas a 1a

præcessio aequin. 1[illegible] est 28° 32' in anno 1671

Stellarum Nomina.	Longitudo. s ° '	Latitudo. ° '	Mag
Cauda ♌	4.18.26	12.18. B	1
Informis Helicæ circa caudam	4.20. 6ſ.	40. 6. B	2
Ultima caudæ Ursæ Majoris	4.23.35	54.25. B	2
In extremo alæ ♍ Australis	4.23.55	0.43. B	3
Præcedens 4 in sinistra ala	5. 1.39	1.25. B	4
Vindemiatrix	5. 6.46	16.15.ſ.B	3
Altera sequens	5. 6.58ſ.	2.50. B	3
In dextro latere sub cingulo	5. 8.18	8.41. B	3
Ultima in sinistra ala	5.15. 0	1.45. B	4
Sinister humerus Bootæ	5.15.28ſ.	49.33.ſ.B	3
Spica Virginis	5.20.39	1.59. A	1
Arcturus	5.21. 2	31. 2.ſ.B	1
Lucida Coronæ	6. 9. 1ſ.	44.23. B	2
Lanx austrina ♎	6.11.54	0.26. B	2
Lanx borea ♎	6.16.11	8.35. B	2
Sub boriali lance in sinistro brachio	6.17.50	7.37. A	3
Lucida colli serpentis	6.18.53	25.35. B	2
Tertia ab austrina lance ad ortum	6.21.56	4.28. B	3
Dexter humerus Herculis	6.27.50ſ.	42.48. B	3
Sinistra manus Ophiuchi	6.29. 7ſ.	17.19. B	3
Media Lucidiorum in fronte ♏	6.29.22	1.54.ſ.A	3
Australis earundem	6.29.48	1.22.ſ.A	3
Suprema in fronte ♏	6.29.59	1. 5. B	2
Sinistrum genu Ophiuchi	7. 6. 2	11.30. B	3
Cor ♏ Antares	7. 6.36	4.27. A	1
Sinister humerus Herculis	7.11.33	47.47. B	3
Caput Herculis	7.12.54	37.23. B	3
Genu dextrum Ophiuchi	7.14.47	7.18. B	3
In dextra tibia Ophiuchi	7.16.46	2.12. B	3
Caput Ophiuchi	7.19.13	35.57. B	3
Dexter humerus ejusdem	7.22. 8	28. 1. B	3
Lucida Capitis Draconis	7.24.47	75. 3.ſ.B	3

Catalogus Quarundam Fixarum.

Stellarum Nomina.	*Longitudo.* s ° ′	*Latitudo.* ° ′	*Mag*
Lucida Lyræ	8.12. 6	61.47.ſ.B	1
Orientalis ſive ultima capitis ♐	8.13. 6	1.31. B	4
Cauda Vulturis	8.16.38	36.16.ſ.B	3
Roſtrum Cygni	8.28. 7	49. 2. B	3
Lucida Vulturis	8.28.32	29.21.ſ.B	2
Trium in cornu ♑ { *Borea*	9. 0.41	7. 2. B	3
Trium in cornu ♑ { *Auſtralis*	9. 0.54	4.41. B	3
Antecedens lucidior in manu ♒	9. 8.35	8.10. B	4
Superior ala Cygni	9.13.16	64.28. B	3
Duarum lucidarum in Cauda ♑ *præcedens*	9.18.37	2.26. A	3
Siniſter humerus ♒	9.20.14	8.42. B	3
Sequens caudæ ♑	9.20.23	2.29. A	3
Pectus Cygni	9.21.48	57. 9. B	3
Os Pegaſi	9.28.45	22. 7.ſ.B	3
Inferior ala Cygni	10. 0. 6	43.44. B	3
Dexter humerus ♒	10. 0.12	10.42. B	3
Fomahant	10. 0.34ſ.	21. 0. A	1
Cauda Cygni	10. 2.16ſ.	59.56.ſ.B	2
Cubitus dexter ♒	10. 3.33	8.17.ſ.B	3
Auſtralis dextræ tibiæ ♒	10. 5.45	8.10. B	3
Marchab Pegaſi	10.20.19ſ.	19.26. B	2
Scheat Pegaſi	10.26.12	31. 7.ſ.B	2
Borealis caudæ Ceti	10.27.46	10. 1. A	3
Auſtralis caudæ Ceti	10.29.19	20.47. A	2
Extrema alæ Pegaſi	11. 6. 1	12.35. B	2
Ad caudam Ceti præcedens	11. 8.34ſ	16.55. A	3
Dexter humerus Cephei	11. 9.36	68.54. B	3
Caput Andromedæ	11.11.10	25.42. B	2
Ad caudam Ceti ſequens	11.13. 5ſ.	15.46. A	3
In Ventre Ceti borea	11.18.48	20.19. A	3
Nodus lini ♓	11.26.10ſ.	9. 4.ſ.A	3
Cinguli Andromedæ auſtralis	11.27.12	25.59. B	2

CANON TRIANGULORUM LOGARITHMICUS.

	0.				1.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
0	0.000000	10.000000	0.000000	Infinita.	8.241855	9.999934	8.241921	11.758079	60
1	6.463726	10.000000	6.463726	13.536274	8.249033	9.999932	8.249102	11.750898	59
2	6.764756	10.000000	6.764756	13.235244	8.256094	9.999929	8.256165	11.743835	58
3	6.940847	10.000000	6.940847	13.059153	8.263042	9.999927	8.263115	11.736885	57
4	7.065786	10.000000	7.065786	12.934214	8.269881	9.999925	8.269956	11.730044	56
5	7.162696	10.000000	7.162696	12.837304	8.276614	9.999922	8.276691	11.723309	55
6	7.241877	9.999999	7.241878	12.758122	8.283243	9.999920	8.283323	11.716677	54
7	7.308824	9.999999	7.308825	12.691175	8.289773	9.999918	8.289856	11.710144	53
8	7.366816	9.999999	7.366817	12.633183	8.296207	9.999915	8.296292	11.703708	52
9	7.417968	9.999999	7.417970	12.582030	8.302546	9.999913	8.302634	11.697366	51
10	7.463726	9.999998	7.463727	12.536273	8.308794	9.999910	8.308884	11.691116	50
11	7.505118	9.999998	7.505120	12.494880	8.314954	9.999907	8.315046	11.684954	49
12	7.542906	9.999997	7.542909	12.457091	8.321027	9.999905	8.321122	11.678878	48
13	7.577668	9.999997	7.577672	12.422328	8.327016	9.999902	8.327114	11.672886	47
14	7.609853	9.999996	7.609857	12.390143	8.332924	9.999899	8.333025	11.666975	46
15	7.639816	9.999996	7.639820	12.360180	8.338753	9.999897	8.338856	11.661144	45
16	7.667845	9.999995	7.667849	12.332151	8.344504	9.999894	8.344610	11.655390	44
17	7.694173	9.999995	7.694179	12.305821	8.350181	9.999891	8.350289	11.649711	43
18	7.718997	9.999994	7.719003	12.280997	8.355783	9.999888	8.355895	11.644105	42
19	7.742478	9.999993	7.742484	12.257516	8.361315	9.999885	8.361430	11.638570	41
20	7.764754	9.999993	7.764761	12.235239	8.366777	9.999882	8.366895	11.633105	40
21	7.785943	9.999992	7.785951	12.214049	8.372171	9.999879	8.372292	11.627708	39
22	7.806146	9.999991	7.806155	12.193845	8.377499	9.999876	8.377622	11.622378	38
23	7.825451	9.999990	7.825460	12.174540	8.382762	9.999873	8.382889	11.617111	37
24	7.843934	9.999989	7.843944	12.156056	8.387962	9.999870	8.388092	11.611908	36
25	7.861662	9.999989	7.861674	12.138326	8.393101	9.999867	8.393234	11.606766	35
26	7.878695	9.999988	7.878708	12.121292	8.398179	9.999864	8.398315	11.601685	34
27	7.895085	9.999987	7.895099	12.104901	8.403199	9.999861	8.403338	11.596662	33
28	7.910879	9.999986	7.910894	12.089106	8.408161	9.999858	8.408304	11.591696	32
29	7.926119	9.999985	7.926134	12.073866	8.413068	9.999854	8.413213	11.586787	31
30	7.940842	9.999983	7.940858	12.059142	8.417919	9.999851	8.418068	11.581932	30
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	89.				88.				

	0.				1.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
30	7.940842	9.999983	7.940858	12.059142	8.417919	9.999851	8.418068	11.581932	30
31	7.955082	9.999982	7.955100	12.044900	8.422717	9.999848	8.422869	11.577131	29
32	7.968870	9.999981	7.968889	12.031111	8.427462	9.999844	8.427618	11.572382	28
33	7.982233	9.999980	7.982253	12.017747	8.432156	9.999841	8.432315	11.567685	27
34	7.995198	9.999979	7.995219	12.004781	8.436800	9.999838	8.436962	11.563038	26
35	8.007787	9.999977	7.007809	11.992191	8.441394	9.999834	8.441560	11.558440	25
36	8.020021	9.999976	8.020044	11.979956	8.445941	9.999831	8.446110	11.553890	24
37	8.031919	9.999975	8.031945	11.968055	8.450440	9.999827	8.450613	11.549387	23
38	8.043501	9.999973	8.043527	11.956473	8.454893	9.999824	8.455070	11.544930	22
39	8.054781	9.999972	8.054809	11.945191	8.459301	9.999820	8.459481	11.540519	21
40	8.065776	9.999971	8.065806	11.934194	8.463665	9.999816	8.463849	11.536151	20
41	8.076500	9.999969	8.076531	11.923469	8.467985	9.999813	8.468172	11.531828	19
42	8.086965	9.999968	8.086997	11.913003	8.472263	9.999809	8.472454	11.527546	18
43	8.097183	9.999966	8.097217	11.902783	8.476498	9.999805	8.476693	11.523307	17
44	8.107167	9.999964	8.107203	11.892797	8.480693	9.999801	8.480892	11.519108	16
45	8.116926	9.999963	8.116963	11.883037	8.484848	9.999797	8.485050	11.514950	15
46	8.126471	9.999961	8.126510	11.873490	8.488963	9.999794	8.489170	11.510830	14
47	8.135810	9.999959	8.135851	11.864149	8.493040	9.999790	8.493250	11.506750	13
48	8.144953	9.999958	8.144996	11.855004	8.497078	9.999786	8.497293	11.502707	12
49	8.153907	9.999956	8.153952	11.846048	8.501080	9.999782	8.501298	11.498702	11
50	8.162681	9.999954	8.162737	11.837273	8.505045	9.999778	8.505267	11.494733	10
51	8.171280	9.999952	8.171328	11.828672	8.508974	9.999774	8.509200	11.490800	9
52	8.179713	9.999950	8.179763	11.820237	8.512867	9.999769	8.513098	11.486902	8
53	8.187985	9.999948	8.188036	11.811964	8.516726	9.999768	8.516961	11.483039	7
54	8.196102	9.999946	8.196156	11.803844	8.520551	9.999761	8.520790	11.479210	6
55	8.204070	9.999944	8.204126	11.795874	8.524343	9.999757	8.524586	11.475414	5
56	8.211895	9.999942	8.211953	11.788047	8.528102	9.999753	8.528349	11.471651	4
57	8.219581	9.999940	8.219641	11.780359	8.531828	9.999748	8.532080	11.467920	3
58	8.227134	9.999938	8.227195	11.772805	8.535523	9.999744	8.535779	11.464221	2
59	8.234557	9.999936	8.234621	11.765379	8.539186	9.999740	8.539447	11.460552	1
60	8.241855	9.999934	8.241921	11.758079	8.542819	9.999735	8.543084	11.456916	0
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	89.				88.				

	2.				3.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
0	8.542819	9.999735	8.543084	11.456916	8.718800	9.999404	8.719396	11.280604	60
1	8.546422	9.999731	8.546691	11.453309	8.721204	9.999398	8.721806	11.278194	59
2	8.549995	9.999726	8.550268	11.449732	8.723595	9.999391	8.724204	11.275796	58
3	8.553539	9.999722	8.553817	11.446183	8.725972	9.999384	8.726588	11.273412	57
4	8.557054	9.999717	8.557336	11.442664	8.728336	9.999378	8.728959	11.271041	56
5	8.560540	9.999713	8.560828	11.439172	8.730688	9.999371	8.731317	11.268683	55
6	8.563999	9.999708	8.564291	11.435709	8.733027	9.999364	8.733663	11.266337	54
7	8.567431	9.999704	8.567727	11.432273	8.735354	9.999357	8.735996	11.264004	53
8	8.570836	9.999699	8.571137	11.428863	8.737667	9.999350	8.738317	11.261683	52
9	8.574214	9.999694	8.574520	11.425480	8.739969	9.999343	8.740626	11.259374	51
10	8.577566	9.999689	8.577877	11.422123	8.742259	9.999336	8.742922	11.257078	50
11	8.580892	9.999685	8.581208	11.418792	8.744536	9.999329	8.745207	11.254793	49
12	8.584193	9.999680	8.584514	11.415486	8.746802	9.999322	8.747479	11.252521	48
13	8.587469	9.999675	8.587795	11.412205	8.749055	9.999315	8.749740	11.250260	47
14	8.590721	9.999670	8.591051	11.408949	8.751297	9.999308	8.751989	11.248011	46
15	8.593948	9.999665	8.594283	11.405717	8.753528	9.999301	8.754227	11.245773	45
16	8.597152	9.999660	8.597492	11.402508	8.755747	9.999294	8.756453	11.243547	44
17	8.600332	9.999655	8.600677	11.399323	8.757955	9.999287	8.758668	11.241332	43
18	8.603489	9.999650	8.603839	11.396161	8.760151	9.999279	8.760872	11.239128	42
19	8.606623	9.999645	8.606978	11.393022	8.762337	9.999272	8.763065	11.236935	41
20	8.609734	9.999640	8.610094	11.389906	8.764511	9.999265	8.765246	11.234754	40
21	8.612823	9.999635	8.613189	11.386811	8.766675	9.999257	8.767417	11.232583	39
22	8.615891	9.999629	8.616262	11.383738	8.768828	9.999250	8.769578	11.230422	38
23	8.618937	9.999624	8.619313	11.380687	8.770970	9.999242	8.771727	11.228273	37
24	8.621967	9.999619	8.622343	11.377657	8.773101	9.999235	8.773866	11.226134	36
25	8.624965	9.999614	8.625352	11.374648	8.775223	9.999227	8.775995	11.224005	35
26	8.627948	9.999608	8.628340	11.371660	8.777333	9.999220	8.778114	11.221886	34
27	8.630911	9.999603	8.631308	11.368692	8.779434	9.999212	8.780222	11.219778	33
28	8.633854	9.999597	8.634256	11.365744	8.781524	9.999205	8.782320	11.217680	32
29	8.636776	9.999592	8.637184	11.362816	8.783605	9.999197	8.784408	11.215592	31
30	8.639680	9.999586	8.640093	11.359907	8.785675	9.999189	8.786486	11.213514	30
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	87.				86.				

	2.					3.			
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
30	8.639680	9.999586	8.640093	11.359907	8.785675	9.999189	8 786486	11.213514	30
31	8.642563	9.999581	8.642982	11.357018	8.787736	9.999181	8.788554	11.211446	29
32	8.645428	9.999575	8.645853	11.354147	8.789787	9.999174	8.790613	11.209387	28
33	8.648274	9.999570	8.648704	11.351296	8.791828	9.999166	8.792662	11.207338	27
34	8.651102	9.999564	8.651537	11.348463	8.793859	9.999158	8.794701	11.205299	26
35	8.653911	9.999558	8.654352	11.345648	8.795881	9.999150	8.796731	11.203269	25
36	8.656702	9.999553	8.657149	11.342851	8.797894	9.999142	8.798752	11.201248	24
37	8.659475	9.999547	8.659928	11.340072	8.799897	9 999134	8 800763	11.199237	23
38	8.662230	9.999541	8 662689	11.337311	8.801892	9.999126	8.802765	11.197235	22
39	8.664968	9.999535	8.665433	11.334567	8.803876	9.999118	8.804758	11.195242	21
40	8.667689	9.999529	8.668160	11.331840	8.805852	9.999110	8 806742	11.193258	20
41	8.670393	9.999524	8.670870	11.329130	8.807819	9 999102	8.808717	11.191283	19
42	8.673080	9.999518	8.673563	11.326437	8.809777	9 999094	8 810683	11.189317	18
43	8 675751	9.999512	8.676239	11 323761	8.811726	9.999086	8.812641	11.187359	17
44	8.678405	9.999506	8.678900	11.321100	8.813667	9.999077	8.814589	11.185411	16
45	8.681043	9.999500	8.681544	11.318456	8.815599	9.999069	8.816529	11.183471	15
46	8.683665	9.999493	8 684172	11.315828	8.817522	9.999061	8.818461	11.181539	14
47	8.686272	9.999487	8.686784	11.313216	8.819436	9.999053	8.820384	11.179616	13
48	8.688863	9.999481	8.689381	11 310619	8.821343	9.999044	8.822298	11 177702	12
49	8.691438	9.999475	8.691963	11.308037	8.823240	9 999036	8.824205	11.175795	11
50	8.693998	9.999469	8.694529	11.305471	8 825130	9.999027	8.826103	11.173897	10
51	8.696543	9.999463	8 697081	11.302919	8.827011	9.999019	8.827992	11 172008	9
52	8.699073	9.999456	8.699617	11.300383	8.828884	9 999010	8.829874	11.170126	8
53	8 701589	9.999450	8.702139	11.297861	8 830749	9.999002	8.831748	11.168252	7
54	8.704090	9.999443	8.704646	11.295354	8.832607	9.998993	8.833613	11.166387	6
55	8.706577	9.999437	8.707140	11.292860	8.834456	9.998984	8.835471	11.164529	5
56	8.709049	9.999431	8 709618	11.293082	8.836297	9 998976	8.837321	11.162679	4
57	8.711507	9.999424	8.712083	11.287917	8.838130	9.998967	8.839163	11.160837	3
58	8.713952	9.999418	8.714534	11.285466	8 839956	9.998958	8.840998	11.159002	2
59	8.716383	9.999411	8.716972	11.283028	8.841774	9.998950	8.842825	11.157175	1
60	8.718800	9.999404	8.719396	11.280604	8.843585	9.998941	8.844644	11.155356	0
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	87.				86.				

	4.				5.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
0	8.843585	9.998941	8.844644	11.155356	8.940296	9.998344	8.941952	11.058048	60
1	8.845387	9.998932	8.846455	11.153545	8.941738	9.998333	8.943404	11.056596	59
2	8.847183	9.998923	8.848260	11.151740	8.943174	9 998322	8.944852	11 055148	58
3	8.848971	9.998914	8 850057	11.149943	8.944606	9.998311	8.946295	11 053705	57
4	8.850751	9.998905	8.851846	11.148154	8.946034	9.998300	8.947734	11.052266	56
5	8.852525	9.998896	8.853628	11.146372	8.947456	9.998289	8.949168	11.050832	55
6	8 854291	9.998887	8.855403	11.144597	8 948874	9.998277	8.950597	11.049403	54
7	8.856049	9.998878	8.857171	11.142829	8.950287	9.998266	8.952021	11.047979	53
8	8.857801	9.998869	8.858932	11.141068	8.951696	9.998255	8.953441	11.046559	52
9	8.859546	9 998860	8.860686	11.139314	8.953100	9.998243	8 954856	11 045144	51
10	8.861283	9.998851	8.862433	11 137567	8.954499	9.998232	8.956267	11.043733	50
11	8.863014	9.998841	8.864173	11.135827	8.955894	9.998220	8.957674	11.042326	49
12	8.864738	9.998832	8.865906	11 134094	8.957284	9.998209	8.959075	11.040925	48
13	8.866455	9.998823	8.867632	11.132368	8.958670	9 998197	8.960473	11.039527	47
14	8.868165	9.998813	8.869351	11.130649	8.960052	9.998186	8.961866	11.038134	46
15	8.869868	9.998804	8.871064	11.128936	8.961429	9.998174	8.963255	11.036745	45
16	8 871565	9.998795	8.872770	11.127230	8.962801	9.998163	8 964639	11.035361	44
17	8.873255	9.998785	8.874469	11.125531	8.964170	9.998151	8.966019	11.033981	43
18	8.874938	9.998776	8.876162	11.123838	8.965534	9.998139	8.967394	11.032606	42
19	9.876615	9.998766	8.877849	11.122151	8.966893	9.998128	8.968766	11.031234	41
20	8.878285	9.998757	8.879529	11.120471	8.968249	9.998116	8.970133	11.029867	40
21	8.879949	9.998747	8.881202	11.118798	8.969600	9.998104	8.971496	11.028504	39
22	8.881607	9.998738	8.882869	11.117131	8.970947	9.998092	8.972855	11.027145	38
23	8.883258	9.998728	8.884530	11.115470	8.972289	9.998080	8.974209	11.025791	37
24	8.834903	9.998718	8 886185	11.113815	8 973628	9 998068	8.975560	11.024440	36
25	8.886542	9.998708	8.887833	11.112167	8.974962	9.998056	8.976906	11.023094	35
26	8.888174	9.998699	8.889476	11 110524	8.976293	9.998044	8 978248	11.021752	34
27	8.889801	9.998689	8 891112	11.108888	8.977619	9.998032	8.979586	11.020414	33
28	8.891421	9.998679	8 892742	11.107258	8.978941	9.998020	8.980921	11.019079	32
29	8.893035	9.998669	8.894366	11.105634	8.980259	9.998008	8.982251	11 017749	31
30	8.894643	9 998659	8.895984	11.104016	8.981573	9.997996	8.983577	11.016423	30
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	85.				84.				

	4.				5.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
30	8.894643	9.998659	8.895984	11.104016	8.981573	9.997996	8.983577	11.016423	30
31	8.896246	9.998649	8.897596	11.102404	8.982883	9.997984	8.984899	11.015101	29
32	8.897842	9.998639	8.899203	11.100797	8.984189	9.997972	8.986217	11.013783	28
33	8.899432	9.998629	8.900803	11.099197	8.985491	9.997959	8.987532	11.012468	27
34	8.901017	9.998619	8.902398	11.097602	8.986789	9.997947	8.988842	11.011158	26
35	8.902596	9.998609	8.903987	11.096013	8.988083	9.997935	8.990149	11.009851	25
36	8.904169	9.998599	8.905570	11.094430	8.989374	9.997922	8.991451	11.008549	24
37	8.905736	9.998589	8.907147	11.092853	8.990660	9.997910	8.992750	11.007250	23
38	8.907297	9.998578	8.908719	11.091281	8.991943	9.997897	8.994045	11.005955	22
39	8.908853	9.998568	8.910285	11.089715	8.993228	9.997885	8.995337	11.004663	21
40	8.910404	9.998558	8.911846	11.088154	8.994497	9.997872	8.996624	11.003376	20
41	8.911949	9.998548	8.913401	11.086599	8.995768	9.997860	8.997908	11.002092	19
42	8.913488	9.998537	8.914951	11.085049	8.997036	9.997847	8.999188	11.000812	18
43	8.915022	9.998527	8.916495	11.083505	8.998299	9.997835	9.000465	10.999535	17
44	8.916550	9.998516	8.918034	11.081966	8.999560	9.997822	9.001738	10.998262	16
45	8.918073	9.998506	8.919568	11.080432	9.000816	9.997809	9.003007	10.996993	15
46	8.919591	9.998495	8.921096	11.078904	9.002069	9.997797	9.004272	10.995728	14
47	8.921103	9.998485	8.922619	11.077381	9.003318	9.997784	9.005534	10.994466	13
48	8.922610	9.998474	8.924136	11.075864	9.004563	9.997771	9.006792	10.993208	12
49	8.924112	9.998464	8.925649	11.074351	9.005805	9.997758	9.008047	10.991953	11
50	8.925609	9.998453	8.927156	11.072844	9.007044	9.997745	9.009298	10.990702	10
51	8.927100	9.998442	8.928658	11.071342	9.008278	9.997732	9.010546	10.989454	9
52	8.928587	9.998431	8.930155	11.069845	9.009510	9.997719	9.011790	10.988210	8
53	8.930068	9.998421	8.931647	11.068353	9.010737	9.997706	9.013031	10.986969	7
54	8.931544	9.998410	8.933134	11.066866	9.011962	9.997693	9.014268	10.985732	6
55	8.933015	9.998399	8.934616	11.065384	9.013182	9.997680	9.015502	10.984498	5
56	8.934481	9.998388	8.936093	11.063907	9.014400	9.997667	9.016732	10.983268	4
57	8.935942	9.998377	8.937565	11.062435	9.015613	9.997654	9.017959	10.982041	3
58	8.937398	9.998366	8.939032	11.060968	9.016824	9.997641	9.019183	10.980817	2
59	8.938850	9.998355	8.940494	11.059506	9.018031	9.997628	9.020403	10.979597	1
50	8.940296	9.998344	8.941952	11.058048	9.019235	9.997614	9.021620	10.978380	0
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	85.				84.				

	6.				7.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
0	9.019235	9.997614	9.021620	10.978380	9.085894	9.996751	9.089144	10.910856	60
1	9.020435	9.997601	9.022834	10.977166	9.086922	9.996735	9.090187	10.909813	59
2	9.021632	9.997588	9.024044	10.975956	9.087947	9.996720	9.091228	10.908772	58
3	9.022825	9.997574	9.025251	10.974749	9.088970	9.996704	9.092266	10.907734	57
4	9.024016	9.997561	9.026455	10.973545	9.089990	9.996688	9.093302	10.906698	56
5	9.025203	9.997547	9.027655	10.972345	9.091008	9.996673	9.094336	10.905664	55
6	9.026386	9.997534	9.028852	10.971148	9.092024	9.996657	9.095367	10.904633	54
7	9.027567	9.997520	9.030046	10.969954	9.093037	9.996641	9.096395	10.903605	53
8	9.028744	9.997507	9.031237	10.968763	9.094047	9.996625	9.097422	10.902578	52
9	9.029918	9.997493	9.032425	10.967575	9.095056	9.996610	9.098446	10.901554	51
10	9.031089	9.997480	9.033609	10.966391	9.096062	9.996594	9.099468	10.900532	50
11	9.032257	9.997466	9.034791	10.965209	9.097065	9.996578	9.100487	10.899513	49
12	9.033421	9.997452	9.035969	10.964031	9.098066	9.996562	9.101504	10.898496	48
13	9.034582	9.997439	9.037144	10.962856	9.099065	9.996546	9.102519	10.897481	47
14	9.035741	9.997425	9.038316	10.961684	9.100062	9.996530	9.103532	10.896468	46
15	9.036896	9.997411	9.039485	10.960515	9.101056	9.996514	9.104542	10.895458	45
16	9.038048	9.997397	9.040651	10.959349	9.102048	9.996498	9.105550	10.894450	44
17	9.039197	9.997383	9.041813	10.958187	9.103037	9.996482	9.106556	10.893444	43
18	9.040342	9.997369	9.042973	10.957027	9.104025	9.996465	9.107559	10.892441	42
19	9.041485	9.997355	9.044130	10.955870	9.105010	9.996449	9.108560	10.891440	41
20	9.042625	9.997341	9.045284	10.954716	9.105992	9.996433	9.109559	10.890441	40
21	9.043762	9.997327	9.046434	10.953566	9.106973	9.996417	9.110556	10.889444	39
22	9.044895	9.997313	9.047582	10.952418	9.107951	9.996400	9.111551	10.888449	38
23	9.046026	9.997299	9.048727	10.951273	9.108927	9.996384	9.112543	10.887457	37
24	9.047154	9.997285	9.049869	10.950131	9.109901	9.996368	9.113533	10.886467	36
25	9.048279	9.997271	9.051008	10.948992	9.110873	9.996351	9.114521	10.885479	35
26	9.049400	9.997256	9.052144	10.947856	9.111842	9.996335	9.115507	10.884493	34
27	9.050519	9.997242	9.053277	10.946723	9.112809	9.996318	9.116491	10.883509	33
28	9.051635	9.997228	9.054407	10.945593	9.113774	9.996302	9.117472	10.882528	32
29	9.052749	9.997214	9.055535	10.944465	9.114737	9.996285	9.118452	10.881548	31
30	9.053859	9.997199	9.056659	10.943341	9.115698	9.996269	9.119429	10.880571	30
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	83.				82.				

	6.				7.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
30	9.053859	9.997199	9.056659	10.943341	9.115698	9.996269	9.119429	10.880571	30
31	9.054966	9.997185	9.057781	10.942219	9.116656	9.996252	9.120404	10.879596	29
32	9.056071	9.997170	9.058900	10.941100	9.117613	9.996235	9.121377	10.878623	28
33	9.057172	9.997156	9.060016	10.939984	9.118567	9.996219	9.122348	10.877652	27
34	9.058271	9.997141	9.061130	10.938870	9.119519	9.996202	9.123317	10.876683	26
35	9.059367	9.997127	9.062240	10.937760	9.120469	9.996185	9.124284	10.875716	25
36	9.060460	9.997112	9.063348	10.936652	9.121417	9.996168	9.125249	10.874751	24
37	9.061551	9.997098	9.064453	10.935547	9.122362	9.996151	9.126211	10.873789	23
38	9.062639	9.997083	9.065556	10.934444	9.123306	9.996134	9.127172	10.872828	22
39	9.063724	9.997068	9.066655	10.933345	9.124248	9.996117	9.128130	10.871870	21
40	9.064806	9.997053	9.067752	10.932248	9.125187	9.996100	9.129087	10.870913	20
41	9.065885	9.997039	9.068846	10.931153	9.126125	9.996083	9.130041	10.869959	19
42	9.066962	9.997024	9.069938	10.930062	9.127060	9.996066	9.130994	10.869006	18
43	9.068036	9.997009	9.071027	10.928973	9.127993	9.996049	9.131944	10.868056	17
44	9.069107	9.996994	9.072113	10.927887	9.128925	9.996032	9.132893	10.867107	16
45	9.070176	9.996979	9.073197	10.926803	9.129854	9.996015	9.133839	10.866161	15
46	9.071242	9.996964	9.074278	10.925722	9.130781	9.995998	9.134784	10.865216	14
47	9.072306	9.996949	9.075356	10.924644	9.131706	9.995980	9.135726	10.864274	13
48	9.073366	9.996934	9.076432	10.923568	9.132630	9.995963	9.136667	10.863333	12
49	9.074424	9.996919	9.077505	10.922495	9.133551	9.995946	9.137605	10.862395	11
50	9.075480	9.996904	9.078576	10.921424	9.134470	9.995928	9.138542	10.861458	10
51	9.076533	9.996889	9.079644	10.920356	9.135387	9.995911	9.139476	10.860524	9
52	9.077583	9.996874	9.080710	10.919290	9.136303	9.995894	9.140409	10.859591	8
53	9.078631	9.996858	9.081773	10.918227	9.137216	9.995876	9.141340	10.858660	7
54	9.079676	9.996843	9.082833	10.917167	9.138128	9.995859	9.142269	10.857731	6
55	9.080719	9.996828	9.083891	10.916109	9.139037	9.995841	9.143196	10.856804	5
56	9.081759	9.996812	9.084947	10.915035	9.139944	9.995823	9.144121	10.855879	4
57	9.082797	9.996797	9.086000	10.914000	9.140850	9.995806	9.145044	10.854956	3
58	9.083832	9.996782	9.087050	10.912950	9.141754	9.995788	9.145966	10.854034	2
59	9.084864	9.996766	9.088098	10.911902	9.142655	9.995771	9.146885	10.853115	1
60	9.085894	9.996751	9.089144	10.910856	9.143555	9.995753	9.147803	10.852197	0
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	83.				82.				

	8.				9.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
0	9.143555	9.995753	9.147803	10.852197	9.194332	9.994620	9.199713	10.800287	60
1	9.144453	9.995735	9.148718	10.851282	9.195129	9.994600	9.200529	10.799471	59
2	9.145349	9.995717	9.149632	10.850368	9.195925	9.994580	9.201345	10 798655	58
3	9.146243	9.995699	9 150544	10.849456	9.196719	9 994560	9.202159	10 797841	57
4	9.147136	9.995681	9.151454	10.848546	9.197511	9.994540	9.202971	10.797029	56
5	9.148026	9.995664	9.152363	10.847637	9.198302	9.994519	9.203782	10.796218	55
6	9 148915	9.995646	9.153269	10.846731	9.199091	9.994499	9.204592	10.795408	54
7	9.149802	9.995628	9.154174	10.845826	9.199879	9.994479	9.205400	10.794600	53
8	9.150686	9.995610	9.155077	10.844923	9.200666	9.994459	9.206207	10.793793	52
9	9.151569	9 995591	9.155978	10.844022	9.201451	9.994438	9.207013	10 792987	51
10	9.152451	9.995573	9.156877	10 843123	9.202234	9.994418	9.207817	10.792183	50
11	9.153330	9.995555	9.157775	10.842225	9.203017	9.994398	9.208619	10.791381	49
12	9.154208	9.995537	9.158671	10 841329	9.203797	9.994377	9.209420	10.790580	48
13	9.155083	9.995519	9.159565	10.840435	9.204577	9.994357	9.210220	10 789780	47
14	9.155957	9.995501	9.160457	10.839543	9.205354	9.994336	9.211018	10.788982	46
15	9.156830	9.995482	9.161347	10.838653	9.206131	9.994316	9.211815	10.788185	45
16	9.157700	9.995464	9.162236	10.837764	9.206906	9.994295	9 212611	10.787389	44
17	9.158569	9.995446	9.163123	10.836877	9.207679	9.994274	9.213405	10.786595	43
18	9.159435	9.995427	9.164008	10.835992	9.208452	9.994254	9.214198	10.785802	42
19	9.160301	9.995409	9.164892	10.835108	9.209222	9.994233	9.214989	10.785011	41
20	9.161164	9.995390	9.165774	10.834226	9.209992	9.994212	9.215780	10.784220	40
21	9.162025	9.995372	9.166654	10.833346	9.210760	9.994191	9.216568	10.783432	39
22	9.162885	9.995353	9.167532	10.832468	9.211526	9.994171	9.217356	10.782644	38
23	9.163743	9.995334	9.168409	10.831591	9.212291	9.994150	9.218142	10.781858	37
24	9.164600	9.995316	9 169284	10.830716	9 213055	9.994129	9.218926	10.781074	36
25	9.165454	9.995297	9.170157	10.829843	9.213818	9.994108	9.219710	10.780290	35
26	9.166307	9.995278	9.171029	10 828971	9.214579	9.994087	9.220492	10.779508	34
27	9.167159	9.995260	9.171899	10.828101	9.215338	9.994066	9.221272	10.778728	33
28	9.168008	9.995241	9.172767	10.827233	9.216097	9.994045	9.222052	10.777948	32
29	9.168856	9.995222	9.173634	10.826366	9.216854	9.994024	9.222830	10 777170	31
30	9.169702	9 995203	9.174499	10.825501	9.217609	9.994003	9.223607	10.776393	30
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	81.				80.				

	8.				9.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
30	9.169702	9.995203	9.174499	10.825501	9.217609	9.994003	9.223607	10.776393	30
31	9.170547	9.995184	9.175362	10.824638	9.218363	9.993982	9.224382	10.775681	29
32	9.171389	9.995165	9.176224	10.823776	9.219116	9.993960	9.225156	10.774844	28
33	9.172230	9.995146	9.177084	10.822916	9.219868	9.993939	9.225929	10.774071	27
34	9.173070	9.995127	9.177942	10.822058	9.220618	9.993918	9.226700	10.773300	26
35	9.173908	9.995108	9.178799	10.821201	9.221367	9.993897	9.227471	10.772529	25
36	9.174744	9.995089	9.179655	10.820345	9.222115	9.993875	9.228239	10.771761	24
37	9.175578	9.995070	9.180508	10.819492	9.222861	9.993854	9.229007	10.770993	23
38	9.176411	9.995051	9.181360	10.818640	9.223606	9.993832	9.229773	10.770227	22
39	9.177242	9.995032	9.182211	10.817789	9.224349	9.993811	9.230539	10.769461	21
40	9.178072	9.995013	9.183059	10.816941	9.225092	9.993789	9.231302	10.768698	20
41	9.178900	9.994993	9.183907	10.816093	9.225833	9.993768	9.232065	10.767935	19
42	9.179726	9.994974	9.184752	10.815248	9.226573	9.993746	9.232826	10.767174	18
43	9.180551	9.994955	9.185597	10.814403	9.227311	9.993725	9.233586	10.766414	17
44	9.181374	9.994935	9.186439	10.813561	9.228048	9.993703	9.234345	10.765655	16
45	9.182196	9.994916	9.187280	10.812720	9.228784	9.993681	9.235103	10.764897	15
46	9.183016	9.994896	9.188120	10.811880	9.229518	9.993660	9.235859	10.764141	14
47	9.183834	9.994877	9.188958	10.811042	9.230252	9.993638	9.236614	10.763386	13
48	9.184651	9.994857	9.189794	10.810206	9.230984	9.993616	9.237368	10.762632	12
49	9.185466	9.994838	9.190629	10.809371	9.231715	9.993594	9.238120	10.761880	11
50	9.186280	9.994818	9.191462	10.808538	9.232444	9.993572	9.238872	10.761128	10
51	9.187092	9.994798	9.192294	10.807706	9.233172	9.993550	9.239622	10.760378	9
52	9.187903	9.994779	9.193124	10.806876	9.233899	9.993528	9.240371	10.759629	8
53	9.188712	9.994759	9.193953	10.806047	9.234625	9.993506	9.241118	10.758882	7
54	9.189519	9.994739	9.194780	10.805220	9.235349	9.993484	9.241865	10.758135	6
55	9.190325	9.994720	9.195606	10.804394	9.236073	9.993462	9.242610	10.7[illegible]73[illegible]0	5
56	9.191130	9.994700	9.196430	10.803570	9.236795	9.993440	9.243354	10.756646	4
57	9.191933	9.994680	9.197253	10.802747	9.237515	9.993418	9.244097	10.755903	3
58	9.192734	9.994660	9.198074	10.801926	9.238235	9.993396	9.244839	10.755161	2
59	9.193534	9.994640	9.198894	10.801106	9.238953	9.993374	9.245579	10.754421	1
60	9.194332	9.994620	9.199713	10.800287	9.239670	9.993351	9.246319	10.753681	0
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	81.				80.				

	10.				11.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
0	9.239670	9.993351	9.246319	10.753681	9.280599	9.991974	9.288652	10.711348	60
1	9.240386	9.993329	9.247057	10.752943	9.281248	9.991922	9.289326	10.710674	59
2	9.241101	9.993307	9.247794	10.752205	9.281897	9.991897	9.289999	10.710001	58
3	9.241814	9.993284	9.248530	10.751470	9.282544	9.991873	9.290671	10.709329	57
4	9.242526	9.993262	9.249264	10.750736	9.283190	9.991848	9.291342	10.708658	56
5	9.243237	9.993240	9.249998	10.750002	9.283836	9.991823	9.292013	10.707987	55
6	9.243947	9.993217	9.250730	10.749270	9.284480	9.991797	9.292682	10.707318	54
7	9.244656	9.993195	9.251461	10.748539	9.285124	9.991774	9.293350	10.706650	53
8	9.245363	9.993172	9.252191	10.747809	9.285766	9.991749	9.294017	10.705983	52
9	9.246069	9.993149	9.252920	10.747080	9.286408	9.991724	9.294684	10.705316	51
10	9.246775	9.993127	9.253648	10.746352	9.287048	9.991699	9.295349	10.704651	50
11	9.247478	9.993104	9.254374	10.745626	9.287688	9.991674	9.296013	10.703987	49
12	9.248181	9.993081	9.255100	10.744900	9.288326	9.991649	9.296677	10.703323	48
13	9.248883	9.993059	9.255824	10.744176	9.288964	9.991624	9.297339	10.702661	47
14	9.249583	9.993036	9.256547	10.743453	9.289600	9.991599	9.298001	10.701999	46
15	9.250282	9.993013	9.257269	10.742731	9.290236	9.991574	9.298662	10.701338	45
16	9.250980	9.992990	9.257990	10.742010	9.290870	9.991549	9.299322	10.700678	44
17	9.251677	9.992967	9.258710	10.741290	9.291504	9.991524	9.299980	10.700020	43
18	9.252373	9.992944	9.259429	10.740571	9.292137	9.991498	9.300638	10.699362	42
19	9.253067	9.992921	9.260146	10.739854	9.292768	9.991473	9.301295	10.698705	41
20	9.253761	9.992898	9.260863	10.739137	9.293399	9.991448	9.301951	10.698049	40
21	9.254453	9.992875	9.261578	10.738422	9.294029	9.991422	9.302607	10.697393	39
22	9.255144	9.992852	9.262292	10.737708	9.294658	9.991397	9.303261	10.696739	38
23	9.255834	9.992829	9.263005	10.736995	9.295286	9.991372	9.303914	10.696086	37
24	9.256523	9.992806	9.263717	10.736283	9.295913	9.991346	9.304567	10.695433	36
25	9.257211	9.992783	9.264428	10.735572	9.296539	9.991321	9.305218	10.694782	35
26	9.257898	9.992759	9.265138	10.734862	9.297164	9.991295	9.305869	10.694131	34
27	9.258583	9.992736	9.265847	10.734153	9.297788	9.991270	9.306519	10.693481	33
28	9.259268	9.992713	9.266555	10.733445	9.2984[illegible]2	9.991244	9.307168	10.692832	32
29	9.259951	9.992690	9.267261	10.732739	9.299034	9.991218	9.307816	10.692184	31
30	9.260633	9.992666	9.267967	10.732033	9.299655	9.991193	9.308463	10.691537	30
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	79.				78.				

	10.				11.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
30	9.260633	9.992666	9.267967	10.732033	9.299655	9.991193	9.308463	10.691537	30
31	9.261314	9.992643	9.268671	10.731329	9.300276	9.991167	9.309109	10.690891	29
32	9.261994	9.992619	9.269375	10.730625	9.300895	9.991141	9.309754	10.690246	28
33	9.262673	9.992596	9.270077	10.729923	9.301514	9.991115	9.310399	10.689601	27
34	9.263351	9.992527	9.270779	10.729221	9.302132	9.991090	9.311042	10.688958	26
35	9.264027	9.992549	9.271479	10.728521	9.302748	9.991064	9.311685	10.688315	25
36	9.264703	9.992525	9.272178	10.727822	9.303364	9.991038	9.312327	10.687673	24
37	9.265377	9.992501	9.272876	10.727124	9.303979	9.991012	9.312968	10.687032	23
38	9.266051	9.992478	9.273573	10.726427	9.304593	9.990986	9.313608	10.686392	22
39	9.266723	9.992454	9.274269	10.725731	9.305207	9.990960	9.314247	10.685753	21
40	9.267395	9.992430	9.274964	10.725036	9.305819	9.990934	9.314885	10.685115	20
41	9.268065	9.992406	9.275658	10.724342	9.306430	9.990908	9.315523	10.684477	19
42	9.268734	9.992382	9.276351	10.723649	9.307041	9.990882	9.316159	10.683841	18
43	9.269402	9.992359	9.277043	10.722957	9.307650	9.990855	9.316795	10.683205	17
44	9.270069	9.992335	9.277734	10.722266	9.308259	9.990829	9.317430	10.682570	16
45	9.270735	9.992311	9.278424	10.721576	9.308867	9.990803	9.318064	10.681936	15
46	9.271400	9.992287	9.279113	10.720887	9.309474	9.990777	9.318697	10.681303	14
47	9.272064	9.992263	9.279801	10.720199	9.310080	9.990750	9.319330	10.680670	13
48	9.272726	9.992239	9.280488	10.719512	9.310685	9.990724	9.319961	10.680039	12
49	9.273388	9.992214	9.281174	10.718826	9.311289	9.990697	9.320592	10.679408	11
50	9.274049	9.992190	9.281858	10.718142	9.311893	9.990671	9.321222	10.678778	10
51	9.274708	9.992166	9.282542	10.717458	9.312495	9.990645	9.321851	10.678149	9
52	9.275367	9.992142	9.283225	10.716775	9.313097	9.990618	9.322479	10.677521	8
53	9.276025	9.992118	9.283907	10.716093	9.313698	9.990591	9.323106	10.676894	7
54	9.276681	9.992093	9.284588	10.715412	9.314297	9.990565	9.323733	10.676267	6
55	9.277337	9.992069	9.285268	10.714732	9.314897	9.990538	9.324358	10.675642	5
56	9.277991	9.992044	9.285947	10.714053	9.315495	9.990511	9.324983	10.675017	4
57	9.278645	9.992020	9.286624	10.713376	9.316092	9.990485	9.325607	10.674393	3
58	9.279297	9.991996	9.287301	10.712699	9.316689	9.990458	9.326231	10.673769	2
59	9.279948	9.991971	9.287977	10.712023	9.317284	9.990431	9.326853	10.673147	1
60	9.280599	9.991947	9.288652	10.711348	9.317879	9.990404	9.327475	10.672525	0
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	79.				78.				

M	12. SIN.	Co-sin.	TAN.	Co-tan.	13. SIN.	Co-sin.	TAN.	Co-tan.	
0	9.317879	9.990404	9.327475	10.672525	9.352088	9.988724	9.363364	10.636636	60
1	9.318473	9.990378	9.328095	10.671905	9.352635	9.988695	9.363940	10.636060	59
2	9.319066	9.990351	9.328715	10.671285	9.353181	9.988666	9.364515	10.635485	58
3	9.319658	9.990324	9.329334	10.670666	9.353726	9.988636	9.365090	10.634910	57
4	9.320250	9.990297	9.329953	10.670047	9.354271	9.988607	9.365664	10.634336	56
5	9.320840	9.990270	9.330570	10.669430	9.354815	9.988578	9.366237	10.633763	55
6	9.321430	9.990243	9.331187	10.668813	9.355358	9.988548	9.366810	10.633190	54
7	9.322019	9.990215	9.331803	10.668197	9.355901	9.988519	9.367382	10.632618	53
8	9.322607	9.990188	9.332418	10.667582	9.356443	9.988489	9.367953	10.632047	52
9	9.323194	9.990161	9.333033	10.666967	9.356984	9.988460	9.368524	10.631476	51
10	9.323780	9.990134	9.333646	10.666354	9.357524	9.988430	9.369094	10.630906	50
11	9.324366	9.990107	9.334259	10.665741	9.358064	9.988401	9.369663	10.630337	49
12	9.324950	9.990079	9.334871	10.665129	9.358603	9.988371	9.370232	10.629768	48
13	9.325534	9.990052	9.335482	10.664518	9.359141	9.988342	9.370799	10.629201	47
14	9.326117	9.990025	9.336093	10.663907	9.359678	9.988312	9.371367	10.628633	46
15	9.326700	9.989997	9.336702	10.663298	9.360215	9.988282	9.371933	10.628067	45
16	9.327281	9.989970	9.337311	10.662689	9.360752	9.988252	9.372499	10.627501	44
17	9.327862	9.989942	9.337919	10.662081	9.361287	9.988223	9.373064	10.626936	43
18	9.328442	9.989915	9.338527	10.661473	9.361822	9.988193	9.373629	10.626371	42
19	9.329021	9.989887	9.339133	10.660867	9.362356	9.988163	9.374193	10.625807	41
20	9.329599	9.989860	9.339739	10.660261	9.362889	9.988133	9.374756	10.625244	40
21	9.330176	9.989832	9.340344	10.659656	9.363422	9.988103	9.375319	10.624681	39
22	9.330753	9.989804	9.340948	10.659052	9.363954	9.988073	9.375881	10.624119	38
23	9.331329	9.989777	9.341552	10.658448	9.364485	9.988043	9.376442	10.623558	37
24	9.331903	9.989749	9.342155	10.657845	9.365016	9.988013	9.377003	10.622997	36
25	9.332478	9.989721	9.342757	10.657243	9.365546	9.987983	9.377563	10.622437	35
26	9.333051	9.989693	9.343358	10.656642	9.366075	9.987953	9.378122	10.621878	34
27	9.333624	9.989665	9.343958	10.656042	9.366604	9.987922	9.378681	10.621319	33
28	9.334195	9.989637	9.344558	10.655442	9.367132	9.987892	9.379239	10.620761	32
29	9.334767	9.989610	9.345157	10.654843	9.367659	9.987862	9.379797	10.620203	31
30	9.335337	9.989582	9.345755	10.654245	9.368185	9.987832	9.380354	10.619646	30
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	77.				76.				

M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
	12.				13.				
30	9·335337	9·989582	9·345755	10·654245	9·368185	9·987832	9·380345	10·619646	30
31	9·335906	9·989553	9·346353	10·653647	9·368711	9·987801	9·380910	10·619090	29
32	9·336475	9·989525	9·346949	10·653051	9·369236	9·987771	9·381466	10·618534	28
33	9·337043	9·989497	9·347545	10·652455	9·369761	9·987740	9·382020	10·617980	27
34	9·337610	9·989469	9·348141	10·651859	9·370285	9·987710	9·382575	10·617425	26
35	9·338176	9·989441	9·348735	10·651265	9·370808	9·987679	9·383129	10·616871	25
36	9·338742	9·989413	9·349329	10·650671	9·371330	9·987649	9·383682	10·616318	24
37	9·339307	9·989385	9·349922	10·650078	9·371852	9·987618	9·384234	10·615766	23
38	9·339871	9·989356	9·350514	10·649486	9·372373	9·987588	9·384786	10·615214	22
39	9·340434	9·989328	9·351106	10·648894	9·372894	9·987557	9·385337	10·614663	21
40	9·340996	9·989300	9·351697	10·648303	9·373414	9·987526	9·385888	10·614112	20
41	9·341558	9·989271	9·352287	10·647713	9·373933	9·987496	9·386438	10·613562	19
42	9·342119	9·989243	9·352876	10·647124	9·374452	9·987465	9·386987	10·613013	18
43	9·342679	9·989214	9·353465	10·646535	9·374970	9·987434	9·387536	10·612464	17
44	9·343239	9·989186	9·354053	10·645947	9·375487	9·987403	9·388084	10·611916	16
45	9·343797	9·989157	9·354640	10·645360	9·376003	9·987372	9·388631	10·611369	15
46	9·344355	9·989128	9·355227	10·644773	9·376519	9·987341	9·389178	10·610822	14
47	9·344912	9·989100	9·355813	10·644187	9·377035	9·987310	9·389724	10·610276	13
48	9·345469	9·989071	9·356398	10·643602	9·377549	9·987279	9·390270	10·609730	12
49	9·346024	9·989042	9·356982	10·643018	9·378063	9·987248	9·390815	10·609185	11
50	9·346579	9·989014	9·357566	10·642434	9·378577	9·987217	9·391360	10·608640	10
51	9·347134	9·988985	9·358149	10·641851	9·379089	9·987186	9·391903	10·608097	9
52	9·347687	9·988956	9·358731	10·641269	9·379601	9·987155	9·392447	10·607553	8
53	9·348240	9·988927	9·359313	10·640687	9·380113	9·987124	9·392989	10·607011	7
54	9·348792	9·988898	9·359893	10·640107	9·380624	9·987092	9·393531	10·606469	6
55	9·349343	9·988869	9·360474	10·639526	9·381134	9·987061	9·394073	10·605927	5
56	9·349893	9·988840	9·361053	10·638947	9·381643	9·987030	9·394614	10·605386	4
57	9·350443	9·988811	9·361632	10·638368	9·382152	9·986998	9·395154	10·604846	3
58	9·350992	9·988782	9·362210	10·637790	9·382661	9·986967	9·395694	10·604306	2
59	9·351540	9·988753	9·362787	10·637213	9·383168	9·986936	9·396233	10·603767	1
60	9·352088	9·988724	9·363364	10·636636	9·383675	9·986904	9·396771	10·603229	0
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	77.				76.				

	14.				15.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
0	9.383675	9.986904	9.396771	10.603229	9.412996	9.984944	9.428052	10.571948	60
1	9.384182	9.986873	9.397309	10.602691	9.413467	9.984910	9.428558	10.571442	59
2	9.384687	9.986841	9.397846	10.602154	9.413938	9.984876	9.429062	10.570938	58
3	9.385192	9.986809	9.398383	10.601617	9.414408	9.984842	9.429566	10.570434	57
4	9.385697	9.986778	9.398919	10.601081	9.414878	9.984808	9.430070	10.569930	56
5	9.386201	9.986746	9.399455	10.600545	9.415347	9.984774	9.430573	10.569427	55
6	9.386704	9.986714	9.399990	10.600010	9.415815	9.984740	9.431075	10.568925	54
7	9.387207	9.986683	9.400524	10.599476	9.416283	9.984706	9.431577	10.568423	53
8	9.387709	9.986651	9.401058	10.598942	9.416851	9.984672	9.432079	10.567921	52
9	9.388210	9.986619	9.401591	10.598409	9.417217	9.984638	9.432580	10.567420	51
10	9.388711	9.986587	9.402124	10.597876	9.417684	9.984603	9.433080	10.566920	50
11	9.389211	9.986555	9.402656	10.597344	9.418150	9.984569	9.433580	10.566420	49
12	9.389711	9.986523	9.403187	10.596813	9.418615	9.984535	9.434080	10.565920	48
13	9.390210	9.986491	9.403718	10.596282	9.419079	9.984500	9.434579	10.565421	47
14	9.390708	9.986459	9.404249	10.595751	9.419544	9.984466	9.435078	10.564922	46
15	9.391206	9.986427	9.404778	10.595222	9.420007	9.984432	9.435576	10.564424	45
16	9.391703	9.986395	9.405308	10.594692	9.420470	9.984397	9.436073	10.563927	44
17	9.392199	9.986363	9.405836	10.594164	9.420933	9.984363	9.436570	10.563430	43
18	9.392695	9.986331	9.406364	10.593636	9.421395	9.984328	9.437067	10.562933	42
19	9.393191	9.986299	9.406892	10.593108	9.421857	9.984294	9.437563	10.562437	41
20	9.393685	9.986266	9.407419	10.592581	9.422318	9.984259	9.438059	10.561941	40
21	9.394179	9.986234	9.407945	10.592055	9.422778	9.984224	9.438554	10.561446	39
22	9.394673	9.986202	9.408471	10.591529	9.423238	9.984190	9.439048	10.560952	38
23	9.395166	9.986169	9.408996	10.591004	9.423697	9.984155	9.439543	10.560457	37
24	9.395658	9.986137	9.409521	10.590479	9.424156	9.984120	9.440036	10.559964	36
25	9.396150	9.986104	9.410045	10.589955	9.424615	9.984085	9.440529	10.559471	35
26	9.396641	9.986072	9.410569	10.589431	9.425073	9.984050	9.441022	10.558978	34
27	9.397132	9.986039	9.411092	10.588908	9.425530	9.984015	9.441514	10.558486	33
28	9.397621	9.986007	9.411615	10.588385	9.425987	9.983981	9.442006	10.557994	32
29	9.398111	9.985974	9.412137	10.587863	9.426443	9.983946	9.442497	10.557503	31
30	9.398600	9.985942	9.412658	10.587342	9.426899	9.983911	9.442988	10.557012	30
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	75.				74.				

	14.				15.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
30	9.398600	9.985942	9.412658	10.587342	9.426899	9.983911	9.442988	10.557012	30
31	9.399088	9.985909	9.413179	10.586821	9.427354	9.983875	9.443479	10.556521	29
32	9.399575	9.985876	9.413699	10.586301	9.427809	9.983840	9.443968	10.556032	28
33	9.400062	9.985843	9.414219	10.585781	9.428263	9.983805	9.444458	10.555542	27
34	9.400549	9.985811	9.414738	10.585262	9.428717	9.983770	9.444947	10.555053	26
35	9.401035	9.985778	9.415257	10.584743	9.429170	9.983735	9.445435	10.554565	25
36	9.401520	9.985745	9.415775	10.584225	9.429623	9.983700	9.445923	10.554077	24
37	9.402005	9.985712	9.416293	10.583707	9.430075	9.983664	9.446411	10.553589	23
38	9.402489	9.985679	9.416810	10.583190	9.430527	9.983629	9.446898	10.553102	22
39	9.402972	9.985646	9.417326	10.582674	9.430978	9.983594	9.447384	10.552616	21
40	9.403455	9.985613	9.417842	10.582158	9.431429	9.983558	9.447870	10.552130	20
41	9.403938	9.985580	9.418358	10.581642	9.431879	9.983523	9.448356	10.551644	19
42	9.404420	9.985547	9.418873	10.581127	9.432329	9.983487	9.448841	10.551159	18
43	9.404901	9.985514	9.419387	10.580613	9.432778	9.983452	9.449326	10.550674	17
44	9.405382	9.985480	9.419901	10.580099	9.433206	9.983416	9.449810	10.550190	16
45	9.405862	9.985447	9.420415	10.579585	9.433675	9.983381	9.450294	10.549706	15
46	9.406341	9.985414	9.420927	10.579073	9.434122	9.983345	9.450777	10.549223	14
47	9.406820	9.985381	9.421440	10.578560	9.434569	9.983309	9.451260	10.548740	13
48	9.407299	9.985347	9.421952	10.578048	9.435016	9.983273	9.451743	10.548257	12
49	9.407777	9.985314	9.422463	10.577537	9.435462	9.983238	9.452225	10.547775	11
50	9.408254	9.985280	9.422974	10.577026	9.435908	9.983202	9.452706	10.547294	10
51	9.408731	9.985247	9.423484	10.576516	9.436353	9.983166	9.453187	10.546813	9
52	9.409207	9.985213	9.423993	10.576007	9.436798	9.983130	9.453668	10.546332	8
53	9.409682	9.985180	9.424503	10.575497	9.437242	9.983094	9.454148	10.545852	7
54	9.410157	9.985146	9.425011	10.574989	9.437686	9.983058	9.454628	10.545372	6
55	9.410632	9.985113	9.425519	10.574481	9.438129	9.983022	9.455107	10.544893	5
56	9.411106	9.985079	9.426027	10.573973	9.438572	9.982986	9.455586	10.544414	4
57	9.411579	9.985045	9.426534	10.573466	9.439014	9.982950	9.456064	10.543936	3
58	9.412052	9.985011	9.427041	10.572959	9.439456	9.982914	9.456542	10.543458	2
59	9.412524	9.984978	9.427547	10.572453	9.439897	9.982878	9.457019	10.542981	1
60	9.412996	9.984944	9.428052	10.571948	9.440338	9.982842	9.457496	10.542504	0
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	75.				74.				

	16.				17.				
M	SIN.	Co-ſin.	TAN.	Co-tan.	SIN.	Co-ſin.	TAN.	Co-tan.	
0	9.440338	9.982842	9.457496	10.542504	9.465935	9.980596	9.485339	10.514661	60
1	9.440778	9.982805	9.457973	10.542027	9.466348	9.980558	9.485791	10.514209	59
2	9.441218	9.982769	9.458449	10.541551	9.466761	9.980519	9.486242	10.513758	58
3	9.441658	9.982733	9.458925	10.541075	9.467173	9.980480	9.486693	10.513307	57
4	9.442096	9.982696	9.459400	10.540600	9.467585	9.980442	9.487143	10.512857	56
5	9.442535	9.982660	9.459875	10.540125	9.467996	9.980403	9.487593	10.512407	55
6	9.442973	9.982624	9.460349	10.539651	9.468407	9.980364	9.488043	10.511957	54
7	9.443410	9.982587	9.460823	10.539177	9.468817	9.980325	9.488492	10.511508	53
8	9.443847	9.982551	9.461297	10.538703	9.469227	9.980286	9.488941	10.511059	52
9	9.444284	9.982514	9.461770	10.538230	9.469637	9.980247	9.489390	10.510610	51
10	9.444720	9.982477	9.462242	10.537758	9.470446	9.980208	9.489838	10.510162	50
11	9.445155	9.982441	9.462715	10.537285	9.470455	9.980169	9.490286	10.509714	49
12	9.445590	9.982404	9.463186	10.536814	9.470863	9.980130	9.490733	10.509267	48
13	9.446025	9.982367	9.463658	10.536342	9.471271	9.980091	9.491180	10.508820	47
14	9.446459	9.982331	9.464128	10.535872	9.471679	9.980052	9.491627	10.508373	46
15	9.446893	9.982294	9.464599	10.535401	9.472086	9.980012	9.492073	10.507927	45
16	9.447326	9.982257	9.465069	10.534931	9.472492	9.979973	9.492519	10.507481	44
17	9.447759	9.982220	9.465539	10.534461	9.472898	9.979934	9.492965	10.507035	43
18	9.448191	9.982183	9.466008	10.533992	9.473304	9.979895	9.493410	10.506590	42
19	9.448623	9.982146	9.466477	10.533523	9.473710	9.979855	9.493854	10.506146	41
20	9.449054	9.982109	9.466945	10.533055	9.474115	9.979816	9.494299	10.505701	40
21	9.449485	9.982072	9.467413	10.532587	9.474519	9.979776	9.494743	10.505257	39
22	9.449915	9.982035	9.467880	10.532120	9.474923	9.979737	9.495186	10.504814	38
23	9.450345	9.981998	9.468347	10.531653	9.475327	9.979697	9.495630	10.504370	37
24	9.450775	9.981961	9.468814	10.531186	9.475730	9.979658	9.496073	10.503927	36
25	9.451204	9.981924	9.469280	10.530720	9.476133	9.979618	9.496515	10.503485	35
26	9.451632	9.981886	9.469746	10.530254	9.476536	9.979579	9.496957	10.503043	34
27	9.452060	9.981849	9.470211	10.529789	9.476938	9.979539	9.497399	10.502601	33
28	9.452488	9.981812	9.470676	10.529324	9.477340	9.979499	9.497841	10.502159	32
29	9.452915	9.981774	9.471141	10.528859	9.477741	9.979459	9.498282	10.501718	31
30	9.453342	9.981737	9.471605	10.528395	9.478142	9.979420	9.498722	10.501278	30
	Co-ſin.	SIN.	Co-tan.	TAN.	Co-ſin.	SIN.	Co-tan.	TAN.	M
	73.				72.				

	16.				17.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
30	9.453342	9.981737	9.471605	10.528395	9.478142	9.979420	9.498722	10.501278	30
31	9.453768	9.981700	9.472069	10.527931	9.478542	9.979380	9.499163	10.500837	29
32	9.454194	9.981662	9.472532	10.527468	9.478942	9.979340	9.499603	10.500397	28
33	9.454619	9.981625	9.472995	10.527005	9.479342	9.979300	9.500042	10.499958	27
34	9.455044	9.981587	9.473457	10.526543	9.479741	9.979260	9.500481	10.499519	26
35	9.455469	9.981549	9.473919	10.526081	9.480140	9.979220	9.500920	10.499080	25
36	9.455893	9.981512	9.474381	10.525619	9.480539	9.979180	9.501359	10.498641	24
37	9.456316	9.981474	9.474842	10.525158	9.480937	9.979140	9.501797	10.498203	23
38	9.456739	9.981436	9.475303	10.524697	9.481334	9.979100	9.502235	10.497765	22
39	9.457162	9.981399	9.475763	10.524237	9.481731	9.979059	9.502672	10.497328	21
40	9.457584	9.981361	9.476223	10.523777	9.482128	9.979019	9.503109	10.496891	20
41	9.458006	9.981323	9.476683	10.523317	9.482525	9.978979	9.503546	10.496454	19
42	9.458427	9.981285	9.477142	10.522858	9.482921	9.978939	9.503982	10.496018	18
43	9.458848	9.981247	9.477601	10.522399	9.483316	9.978898	9.504418	10.495582	17
44	9.459268	9.981209	9.478059	10.521941	9.483712	9.978858	9.504854	10.495146	16
45	9.459688	9.981171	9.478517	10.521483	9.484107	9.978817	9.505289	10.494711	15
46	9.460108	9.981133	9.478975	10.521025	9.484501	9.978777	9.505724	10.494276	14
47	9.460527	9.981095	9.479432	10.520568	9.484895	9.978737	9.506159	10.493841	13
48	9.460946	9.981057	9.479889	10.520111	9.485289	9.978696	9.506593	10.493407	12
49	9.461364	9.981019	9.480345	10.519655	9.485682	9.978655	9.507027	10.492973	11
50	9.461782	9.980981	9.480801	10.519199	9.486075	9.978615	9.507460	10.492540	10
51	9.462199	9.980942	9.481257	10.518743	9.486467	9.978574	9.507893	10.492107	9
52	9.462616	9.980904	9.481712	10.518288	9.486860	9.978533	9.508326	10.491674	8
53	9.463032	9.980866	9.482167	10.517833	9.487251	9.978493	9.508759	10.491241	7
54	9.463448	9.980827	9.482621	10.517379	9.487643	9.978452	9.509191	10.490809	6
55	9.463864	9.980789	9.483075	10.516925	9.488034	9.978411	9.509622	10.490378	5
56	9.464279	9.980750	9.483529	10.516471	9.488424	9.978370	9.510054	10.489946	4
57	9.464694	9.980712	9.483982	10.516018	9.488814	9.978329	9.510485	10.489515	3
58	9.465108	9.980673	9.484435	10.515565	9.489204	9.978288	9.510916	10.489084	2
59	9.465522	9.980635	9.484887	10.515113	9.489593	9.978247	9.511346	10.488654	1
60	9.465935	9.980596	9.485339	10.514661	9.489982	9.978206	9.511776	10.488224	0
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	73.				72.				

	18.				19.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
0	9.489982	9.978206	9.511776	10 488224	9.512642	9.975670	9.536972	10.463028	60
1	9.490371	9.978165	9.512206	10.487794	9.513009	9.975627	9.537382	10 462618	59
2	9.490759	9 978124	9.512635	10.487365	9.513375	9.975583	9.537792	10.462208	58
3	9.491147	9.978083	9.513064	10 486936	9.513741	9.975539	9.538202	10 461798	57
4	9.491535	9.978042	9.513493	10.486507	9 514107	9.975496	9.538611	10.461389	56
5	9.491922	9.978001	9.513921	10.486079	9.514472	9.975452	9.539020	10.460980	55
6	9.492308	9.977959	9.514349	10.485651	9.514837	9.975408	9.539429	10.460571	54
7	9.492695	9.977918	9.514777	10.485223	9.515202	9.975365	9.539837	10.460163	53
8	9. 493081	9 977877	9.515204	10.484796	9.515566	9.975321	9.540245	10.459755	52
9	9.493466	9.977835	9.515631	10.484369	9.515930	9.975277	9.540653	10.459347	51
10	9.493851	9.977794	9.516057	10.483943	9 516294	9.975233	9.541061	10.458939	50
11	9.494236	9.977752	9.516484	10.483516	9.516657	9.975189	9.541468	10.458532	49
12	9.494621	9.977711	9.516910	10.483096	9.517020	9.975145	9.541875	10.458125	48
13	9.495005	9.977669	9.517335	10.482665	9.517382	9.975101	9.542281	10.457719	47
14	9.495388	9.977628	9.517761	10.482239	9.517745	9.975057	9.542688	10.457312	46
15	9.495772	9.977586	9.518186	10.481814	9.518107	9.975013	9.543094	10 456906	45
16	9 496154	9.977544	9.518610	10.481390	9.518468	9.974969	9.543499	10 456501	44
17	9.496537	9.977503	9.519034	10.480966	9.518829	9.974925	9.543905	10 456095	43
18	9.496919	9.977461	9.519458	10.480542	9.519190	9.974880	9.544310	10.455690	42
19	9.497301	9.977419	9.519882	10.480118	9.519551	9.974836	9.544715	10.455285	41
20	9.497682	9.977377	9.520305	10.479695	9.519911	9.974792	9.545119	10 454881	40
21	9.498064	9.977335	9.520728	10.479272	9.520271	9.974748	9.545524	10.454476	39
22	9 498444	9.977293	9.521151	10.478849	9.520631	9.974703	9.545928	10.454072	38
23	9.498825	9.977251	9.521573	10.478427	9 520990	9.974659	9.546331	10.453669	37
24	9.499204	9.977209	9.521995	10.478005	9.521349	9.974614	9.546735	10.453265	36
25	9.499584	9.977167	9.522417	10.477583	9.521707	9.974570	9.547138	10.452862	35
26	9.499963	9.977125	9.522838	10.477162	9.522066	9.974525	9.547540	10.452460	34
27	9.500342	9.977083	9.523259	10.476741	9.522424	9 974481	9.547943	10.452057	33
28	9 500721	9.977041	9.523680	10.476320	9.522781	9.974436	9.548345	10.451655	32
29	9.501099	9.976999	9.524100	10.475900	9.523138	9.974391	9.548747	10.451253	31
30	9.501476	9.976957	9.524520	10.475480	9.523495	9 974347	9.549149	10.450851	30
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	71.				70.				

	18.				19.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
30	9.501476	9.976957	9.524520	10.475480	9.523495	9.974347	9.549149	10.450851	30
31	9.501854	9.976914	9.524940	10.475060	9.523852	9.974302	9.549550	10.450450	29
32	9.502231	9.976872	9.525359	10.474641	9.524208	9.974257	9.549951	10.450049	28
33	9.502607	9.976830	9.525778	10.474222	9.524564	9.974212	9.550352	10.449648	27
34	9.502984	9.976787	9.526197	10.473803	9.524920	9.974167	9.550752	10.449248	26
35	9.503360	9.976745	9.526615	10.473385	9.525275	9.974122	9.551153	10.448847	25
36	9.503735	9.976702	9.527033	10.472967	9.525630	9.974077	9.551552	10.448448	24
37	9.504110	9.976660	9.527451	10.472549	9.525984	9.974032	9.551952	10.448048	23
38	9.504485	9.976617	9.527868	10.472132	9.526339	9.973987	9.552351	10.447649	22
39	9.504860	9.976574	9.528285	10.471715	9.526693	9.973942	9.552750	10.447250	21
40	9.505234	9.976532	9.528702	10.471298	9.527046	9.973897	9.553149	10.446851	20
41	9.505608	9.976489	9.529119	10.470881	9.527400	9.973852	9.553548	10.446452	19
42	9.505981	9.976446	9.529535	10.470465	9.527753	9.973808	9.553946	10.446054	18
43	9.506354	9.976404	9.529951	10.470049	9.528105	9.973761	9.554344	10.445656	17
44	9.506727	9.976361	9.530366	10.469634	9.528458	9.973716	9.554741	10.445259	16
45	9.507099	9.976318	9.530781	10.469219	9.528810	9.973671	9.555139	10.444861	15
46	9.507471	9.976275	9.531196	10.468804	9.529161	9.973625	9.555536	10.444464	14
47	9.507843	9.976232	9.531611	10.468389	9.529513	9.973580	9.555933	10.444067	13
48	9.508214	9.976185	9.532025	10.467975	9.529864	9.973535	9.556329	10.443671	12
49	9.508585	9.976146	9.532439	10.467561	9.530215	9.973489	9.556725	10.443275	11
50	9.508956	9.976103	9.532853	10.467147	9.530565	9.973444	9.557121	10.442879	10
51	9.509326	9.976060	9.533266	10.466734	9.530915	9.973398	9.557517	10.442483	9
52	9.509696	9.976017	9.533679	10.466321	9.531265	9.973352	9.557913	10.442087	8
53	9.510065	9.975973	9.534092	10.465908	9.531614	9.973307	9.558308	10.441692	7
54	9.510434	9.975930	9.534504	10.465496	9.531963	9.973261	9.558703	10.441297	6
55	9.510803	9.975887	9.534916	10.465084	9.532312	9.973215	9.559097	10.440903	5
56	9.511172	9.975844	9.535328	10.464672	9.532661	9.973169	9.559491	10.440509	4
57	9.511540	9.975800	9.535739	10.464261	9.533009	9.973124	9.559885	10.440115	3
58	9.511907	9.975757	9.536150	10.463850	9.533357	9.973078	9.560279	10.439721	2
59	9.512275	9.975713	9.536561	10.463439	9.533704	9.973032	9.560673	10.439327	1
60	9.512642	9.975670	9.536972	10.463028	9.534052	9.972986	9.561066	10.438934	0
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	71.				70.				

	20				21.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
0	9.534052	9.972986	9.561066	10.438934	9.554329	9.970152	9.584177	10.415823	60
1	9.534399	9.972940	9.561459	10.438541	9.554658	9.970103	9.584555	10.415445	59
2	9.534745	9.972894	9.561851	10.438149	9.554987	9.970055	9.584932	10.415068	58
3	9.535092	9.972848	9.562244	10.437756	9.555315	9.970006	9.585309	10.414691	57
4	9.535438	9.972802	9.562636	10.437364	9.555643	9.969957	9.585686	10.414314	56
5	9.535783	9.972755	9.563028	10.436972	9.555971	9.969909	9.586062	10.413938	55
6	9.536129	9.972709	9.563419	10.436581	9.556299	9.969860	9.586439	10.413561	54
7	9.536474	9.972663	9.563811	10.436189	9.556626	9.969811	9.586815	10.413185	53
8	9.536818	9.972617	9.564202	10.435798	9.556953	9.969762	9.587190	10.412810	52
9	9.537163	9.972570	9.564593	10.435407	9.557280	9.969714	9.587566	10.412434	51
10	9.537507	9.972524	9.564983	10.435017	9.557606	9.969665	9.587941	10.412059	50
11	9.537851	9.972478	9.565373	10.434627	9.557932	9.969616	9.588316	10.411684	49
12	9.538194	9.972431	9.565763	10.434237	9.558258	9.969567	9.588691	10.411309	48
13	9.538538	9.972385	9.566153	10.433847	9.558583	9.969518	9.589066	10.410934	47
14	9.538880	9.972338	9.566542	10.433458	9.558909	9.969469	9.589440	10.410560	46
15	9.539223	9.972291	9.566932	10.433068	9.559234	9.969420	9.589814	10.410186	45
16	9.539565	9.972245	9.567320	10.432680	9.559558	9.969370	9.590188	10.409812	44
17	9.539907	9.972198	9.567709	10.432291	9.559883	9.969321	9.590562	10.409438	43
18	9.540249	9.972151	9.568098	10.431902	9.560207	9.969272	9.590935	10.409065	42
19	9.540590	9.972105	9.568486	10.431514	9.560531	9.969223	9.591308	10.408692	41
20	9.540931	9.972058	9.568873	10.431127	9.560855	9.969173	9.591681	10.408319	40
21	9.541272	9.972011	9.569261	10.430739	9.561178	9.969124	9.592054	10.407946	39
22	9.541613	9.971964	9.569648	10.430352	9.561501	9.969075	9.592426	10.407574	38
23	9.541953	9.971917	9.570035	10.429965	9.561824	9.969025	9.592799	10.407201	37
24	9.542293	9.971870	9.570422	10.429578	9.562146	9.968976	9.593171	10.406829	36
25	9.542632	9.971823	9.570809	10.429191	9.562468	9.968926	9.593542	10.406458	35
26	9.542971	9.971776	9.571195	10.428805	9.562790	9.968877	9.593914	10.406086	34
27	9.543310	9.971729	9.571581	10.428419	9.563112	9.968827	9.594285	10.405715	33
28	9.543649	9.971682	9.571967	10.428033	9.563433	9.968777	9.594656	10.405344	32
29	9.543987	9.971635	9.572352	10.427648	9.563755	9.968728	9.595027	10.404973	31
30	9.544325	9.971588	9.572738	10.427262	9.564075	9.968678	9.595398	10.404602	30
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	69.				68.				

	20.				21.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
30	9.544325	9.971588	9.572738	10.427262	9.564075	9.968678	9.595398	10.404602	30
31	9.544663	9.971540	9.573123	10.426877	9.564396	9.968628	9.595768	10.404232	29
32	9.545000	9.971493	9.573507	10.426493	9.564716	9.968578	9.596138	10.403862	28
33	9.545338	9.971446	9.573892	10.426108	9.565036	9.968528	9.596508	10.403492	27
34	9.545674	9.971398	9.574276	10.425724	9.565356	9.968479	9.596878	10.403122	26
35	9.546011	9.971351	9.574660	10.425340	9.565676	9.968429	9.597247	10.402753	25
36	9.546347	9.971303	9.575044	10.424956	9.565995	9.968379	9.597616	10.402384	24
37	9.546683	9.971256	9.575427	10.424573	9.566314	9.968329	9.597985	10.402015	23
38	9.547019	9.971208	9.575810	10.424190	9.566632	9.968278	9.598354	10.401646	22
39	9.547354	9.971161	9.576193	10.423807	9.566951	9.968228	9.598722	10.401278	21
40	9.547689	9.971113	9.576576	10.423424	9.567269	9.968178	9.599091	10.400909	20
41	9.548024	9.971066	9.576959	10.423041	9.567587	9.968128	9.599459	10.400541	19
42	9.548359	9.971018	9.577341	10.422659	9.567904	9.968078	9.599827	10.400173	18
43	9.548693	9.970970	9.577723	10.422277	9.568222	9.968027	9.600194	10.399806	17
44	9.549027	9.970922	9.578104	10.421896	9.568539	9.967977	9.600562	10.399438	16
45	9.549360	9.970874	9.578486	10.421514	9.568856	9.967927	9.600929	10.399071	15
46	9.549693	9.970827	9.578867	10.421133	9.569172	9.967876	9.601296	10.398704	14
47	9.550026	9.970779	9.579248	10.420752	9.569488	9.967826	9.601663	10.398337	13
48	9.550359	9.970731	9.579629	10.420371	9.569804	9.967775	9.602029	10.397971	12
49	9.550692	9.970683	9.580009	10.419991	9.570120	9.967725	9.602395	10.397605	11
50	9.551024	9.970635	9.580389	10.419611	9.570435	9.967674	9.602761	10.397239	10
51	9.551356	9.970586	9.580769	10.419231	9.570751	9.967624	9.603127	10.396873	9
52	9.551687	9.970538	9.581149	10.418851	9.571066	9.967573	9.603493	10.396507	8
53	9.552018	9.970490	9.581528	10.418472	9.571380	9.967522	9.603858	10.396142	7
54	9.552349	9.970442	9.581907	10.418093	9.571695	9.967471	9.604223	10.395777	6
55	9.552680	9.970394	9.582286	10.417714	9.572009	9.967421	9.604588	10.395412	5
56	9.553010	9.970345	9.582665	10.417335	9.572323	9.967370	9.604953	10.395047	4
57	9.553342	9.970297	9.583044	10.416956	9.572636	9.967319	9.605317	10.394683	3
58	9.553670	9.970249	9.583422	10.416578	9.572950	9.967268	9.605682	10.394318	2
59	9.554000	9.970200	9.583800	10.416200	9.573263	9.967217	9.606046	10.393954	1
60	9.554329	9.970152	9.584177	10.415823	9.573575	9.967166	9.606410	10.393590	0
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	69.				68.				

	22				23.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
0	9.573575	9.967166	9.606410	10.393590	9.591878	9.964026	9.627852	10.372148	60
1	9.573888	9.967115	9.606773	10.393227	9.592176	9.963972	9.628203	10.371797	59
2	9.574200	9.967064	9.607137	10.392863	9.592473	9.963919	9.628554	10.371446	58
3	9.574512	9.967013	9.607500	10.392500	9.592770	9.963865	9.628905	10.371095	57
4	9.574824	9.966961	9.607863	10.392137	9.593067	9.963811	9.629255	10.370745	56
5	9.575136	9.966910	9.608225	10.391775	9.593363	9.963757	9.629606	10.370394	55
6	9.575447	9.966859	9.608588	10.391412	9.593659	9.963704	9.629956	10.370044	54
7	9.575758	9.966808	9.608950	10.391050	9.593955	9.963650	9.630306	10.369694	53
8	9.576069	9.966756	9.609312	10.390688	9.594251	9.963596	9.630656	10.369344	52
9	9.576379	9.966705	9.609674	10.390326	9.594547	9.963542	9.631005	10.368995	51
10	9.576689	9.966653	9.610036	10.389964	9.594842	9.963488	9.631355	10.368645	50
11	9.576999	9.966602	9.610397	10.389603	9.595137	9.963434	9.631704	10.368296	49
12	9.577309	9.966550	9.610759	10.389241	9.595432	9.963379	9.632053	10.367947	48
13	9.577618	9.966499	9.611120	10.388880	9.595727	9.963325	9.632402	10.367598	47
14	9.577927	9.966447	9.611480	10.388520	9.596021	9.963271	9.632750	10.367250	46
15	9.578236	9.966395	9.611841	10.388159	9.596315	9.963217	9.633099	10.366901	45
16	9.578545	9.966344	9.612201	10.387799	9.596609	9.963163	9.633447	10.366553	44
17	9.578853	9.966292	9.612561	10.387439	9.596903	9.963108	9.633795	10.366205	43
18	9.579162	9.966240	9.612921	10.387079	9.597196	9.963054	9.634143	10.365857	42
19	9.579470	9.966188	9.613281	10.386719	9.597490	9.962999	9.634490	10.365510	41
20	9.579777	9.966136	9.613641	10.386359	9.597783	9.962945	9.634838	10.365162	40
21	9.580085	9.966085	9.614000	10.386000	9.598075	9.962890	9.635185	10.364815	39
22	9.580392	9.966033	9.614359	10.385641	9.598368	9.962836	9.635532	10.364468	38
23	9.580699	9.965981	9.614718	10.385282	9.598660	9.962781	9.635879	10.364121	37
24	9.581005	9.965929	9.615077	10.384923	9.598952	9.962727	9.636226	10.363774	36
25	9.581312	9.965876	9.615435	10.384565	9.599244	9.962672	9.636572	10.363428	35
26	9.581618	9.965824	9.615793	10.384207	9.599536	9.962617	9.636919	10.363081	34
27	9.581924	9.965772	9.616151	10.383849	9.599827	9.962562	9.637265	10.362735	33
28	9.582229	9.965720	9.616509	10.383491	9.600118	9.962508	9.637611	10.362389	32
29	9.582535	9.965668	9.616867	10.383133	9.600409	9.962453	9.637956	10.362044	31
30	9.582840	9.965615	9.617224	10.382776	9.600700	9.962398	9.638302	10.361698	30
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	67.				66.				

	22.				23.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
30	9.582840	9.965615	9.617224	10.382776	9.600700	9.962398	9.638302	10.361698	30
31	9.583145	9.965563	9.617582	10.382418	9.600990	9.962343	9.638647	10.361353	29
32	9.583449	9.965511	9.617939	10.382061	9.601280	9.962288	9.638992	10.361008	28
33	9.583754	9.965458	9.618295	10.381705	9.601570	9.962233	9.639337	10.360663	27
34	9.584058	9.965406	9.618652	10.381348	9.601860	9.962178	9.639682	10.360318	26
35	9.584361	9.965353	9.619008	10.380992	9.602150	9.962123	9.640027	10.359973	25
36	9.584665	9.965301	9.619364	10.380635	9.602439	9.962067	9.640371	10.359629	24
37	9.584968	9.965248	9.619720	10.380280	9.602728	9.962012	9.640716	10.359284	23
38	9.585272	9.965195	9.620076	10.379924	9.603017	9.961957	9.641060	10.358940	22
39	9.585574	9.965143	9.620432	10.379568	9.603305	9.961902	9.641404	10.358596	21
40	9.585877	9.965090	9.620787	10.379213	9.603594	9.961846	9.641747	10.358253	20
41	9.586179	9.965037	9.621142	10.378858	9.603882	9.961791	9.642091	10.357909	19
42	9.586482	9.964984	9.621497	10.378503	9.604170	9.961735	9.642434	10.357566	18
43	9.586783	9.964931	9.621852	10.378148	9.604457	9.961680	9.642777	10.357223	17
44	9.587085	9.964879	9.622206	10.377793	9.504745	9.961624	9.643120	10.356880	16
45	9.587386	9.964826	9.622561	10.377439	9.605032	9.961569	9.643463	10.356537	15
46	9.587688	9.964773	9.622915	10.377085	9.605319	9.961513	9.643806	10.356194	14
47	9.587989	9.964720	9.623269	10.376731	9.605606	9.961458	9.644148	10.355852	13
48	9.588289	9.964666	9.623623	10.376377	9.605892	9.961402	9.644490	10.355510	12
49	9.588550	9.964613	9.623976	10.376024	9.606179	9.961346	9.644832	10.355168	11
50	9.588890	9.964560	9.624330	10.375670	9.606465	9.961290	9.645174	10.354826	10
51	9.589190	9.964507	9.624683	10.375317	9.606751	9.961235	9.645516	10.354484	9
52	9.589489	9.964454	9.625036	10.374964	9.607036	9.961179	9.645857	10.354143	8
53	9.589789	9.964400	9.625388	10.374612	9.607322	9.961123	9.646199	10.353801	7
54	9.590088	9.964347	9.625741	10.374259	9.607607	9.961067	9.646540	10.353460	6
55	9.590387	9.964294	9.626093	10.373907	9.607892	9.961011	9.646881	10.353119	5
56	9.590686	9.964240	9.626445	10.373555	9.608177	9.960955	9.647222	10.352778	4
57	9.590984	9.964187	9.626797	10.373203	9.608461	9.960899	9.647562	10.352438	3
58	9.591282	9.964133	9.627149	10.372851	9.608745	9.960843	9.647903	10.352097	2
59	9.591580	9.964080	9.627501	10.372499	9.609029	9.960786	9.648243	10.351757	1
60	9.591878	9.964026	9.627852	10.372148	9.609313	9.960730	9.648583	10.351417	0
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	67.				66.				

	24.				25.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
0	9.609313	9.960730	9.648583	10.351417	9.625948	9.957276	9.668673	10.331327	60
1	9.609597	9.960674	9.648923	10.351077	9.626219	9.957217	9.669002	10.330998	59
2	9.609880	9.960618	9.649263	10.350737	9.626490	9.957158	9.669332	10.330668	58
3	9.610164	9.960561	9.649602	10.350398	9.626760	9.957099	9.669661	10.330339	57
4	9.610447	9.960505	9.649942	10.350058	9.627030	9.957040	9.669991	10.330009	56
5	9.610729	9.960448	9.650281	10.349719	9.627300	9.956981	9.670320	10.329680	55
6	9.611012	9.960392	9.650620	10.349380	9.627570	9.956921	9.670649	10.329351	54
7	9.611294	9.960335	9.650959	10.349041	9.627840	9.956862	9.670977	10.329023	53
8	9.611576	9.960279	9.651297	10.348703	9.628109	9.956803	9.671306	10.328694	52
9	9.611858	9.960222	9.651636	10.348364	9.628378	9.956744	9.671635	10.328365	51
10	9.612140	9.960165	9.651974	10.348026	9.628647	9.956684	9.671963	10.328037	50
11	9.612421	9.960109	9.652312	10.347688	9.628916	9.956625	9.672291	10.327709	49
12	9.612702	9.960052	9.652650	10.347350	9.629185	9.956566	9.672619	10.327381	48
13	9.612983	9.959995	9.652988	10.347012	9.629453	9.956506	9.672947	10.327053	47
14	9.613264	9.959938	9.653326	10.346674	9.629721	9.956447	9.673274	10.326726	46
15	9.613545	9.959882	9.653663	10.346337	9.629989	9.956387	9.673602	10.326398	45
16	9.613825	9.959825	9.654000	10.346000	9.630257	9.956327	9.673929	10.326071	44
17	9.614105	9.959768	9.654337	10.345663	9.630524	9.956268	9.674257	10.325743	43
18	9.614385	9.959711	9.654674	10.345326	9.630792	9.956208	9.674584	10.325416	42
19	9.614665	9.959654	9.655011	10.344989	9.631059	9.956148	9.674911	10.325089	41
20	9.614944	9.959596	9.655348	10.344652	9.631326	9.956089	9.675237	10.324763	40
21	9.615223	9.959539	9.655684	10.344316	9.631593	9.956029	9.675564	10.324436	39
22	9.615502	9.959482	9.656020	10.343980	9.631859	9.955969	9.675890	10.324110	38
23	9.615781	9.959425	9.656356	10.343644	9.632125	9.955909	9.676217	10.323783	37
24	9.616060	9.959368	9.656692	10.343308	9.632392	9.955849	9.676543	10.323457	36
25	9.616338	9.959310	9.657028	10.342972	9.632658	9.955789	9.676869	10.323131	35
26	9.616616	9.959253	9.657364	10.342636	9.632923	9.955729	9.677194	10.322806	34
27	9.616894	9.959195	9.657699	10.342301	9.633189	9.955669	9.677520	10.322480	33
28	9.617172	9.959138	9.658034	10.341966	9.633454	9.955609	9.677846	10.322154	32
29	9.617450	9.959080	9.658369	10.341631	9.633719	9.955548	9.678171	10.321829	31
30	9.617727	9.959023	9.658704	10.341296	9.633984	9.955488	9.678496	10.321504	30
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	65.				64.				

	24.				25.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
30	9.617727	9.959023	9.658704	10.341296	9.633984	9.955488	9.678496	10.321504	30
31	9.618004	9.958965	9.659039	10.340961	9.634249	9.955428	9.678821	10.321179	29
32	9.618281	9.958908	9.659373	10.340627	9.634514	9.955368	9.679146	10.320854	28
33	9.618558	9.958850	9.659708	10.340292	9.634778	9.955307	9.679471	10.320529	27
34	9.618834	9.958792	9.660042	10.339958	9.635042	9.955247	9.679795	10.320205	26
35	9.619110	9.958734	9.660376	10.339624	9.635306	9.955186	9.680120	10.319880	25
36	9.619386	9.958677	9.660710	10.339290	9.635570	9.955126	9.680444	10.319556	24
37	9.619662	9.958619	9.661043	10.338957	9.635834	9.955065	9.680768	10.319232	23
38	9.619938	9.958561	9.661377	10.338623	9.636097	9.955005	9.681092	10.318908	22
39	9.620213	9.958503	9.661710	10.338290	9.636360	9.954944	9.681416	10.318584	21
40	9.620488	9.958445	9.662043	10.337957	9.636623	9.954883	9.681740	10.318260	20
41	9.620763	9.958387	9.662376	10.337624	9.636886	9.954823	9.682063	10.317937	19
42	9.621038	9.958329	9.662709	10.337291	9.637148	9.954762	9.682387	10.317613	18
43	9.621313	9.958271	9.663042	10.336958	9.637411	9.954701	9.682710	10.317290	17
44	9.621587	9.958213	9.663375	10.336625	9.637673	9.954640	9.683033	10.316967	16
45	9.621861	9.958154	9.663707	10.336293	9.637935	9.954579	9.683356	10.316644	15
46	9.622135	9.958096	9.664039	10.335961	9.638197	9.954518	9.683679	10.316321	14
47	9.622409	9.958038	9.664371	10.335629	9.638458	9.954457	9.684001	10.315999	13
48	9.622682	9.957979	9.664703	10.335297	9.638720	9.954396	9.684324	10.315676	12
49	9.622956	9.957921	9.665035	10.334965	9.638981	9.954335	9.684646	10.315354	11
50	9.623229	9.957863	9.665366	10.334634	9.639242	9.954274	9.684968	10.315032	10
51	9.623502	9.957804	9.665698	10.334302	9.639503	9.954213	9.685290	10.314710	9
52	9.623774	9.957746	9.666029	10.333971	9.639764	9.954152	9.685612	10.314388	8
53	9.624047	9.957687	9.666360	10.333640	9.640024	9.954090	9.685934	10.314066	7
54	9.624319	9.957628	9.666691	10.333309	9.640284	9.954029	9.686255	10.313745	6
55	9.624591	9.957570	9.667021	10.332979	9.640544	9.953968	9.686577	10.313423	5
56	9.624863	9.957511	9.667352	10.332648	9.640804	9.953906	9.686898	10.313102	4
57	9.625135	9.957452	9.667682	10.332318	9.641064	9.953845	9.687219	10.312781	3
58	9.625406	9.957393	9.668013	10.331987	9.641324	9.953783	9.687540	10.312460	2
59	9.625677	9.957335	9.668343	10.331657	9.641583	9.953722	9.687861	10.312139	1
60	9.625948	9.957276	9.668673	10.331327	9.641842	9.953660	9.688182	10.311818	0
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	65.				64.				

	26.				27.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
0	9.641842	9.953660	9.688182	10.311818	9.657047	9.949881	9.707166	10.292834	60
1	9.642101	9.953599	9.688502	10.311498	9.657295	9.949816	9.707478	10.292522	59
2	9.642360	9.953537	9.688823	10.311177	9.657542	9.949752	9.707790	10.292210	58
3	9.642618	9.953475	9.689143	10.310857	9.657790	9.949688	9.708102	10.291898	57
4	9.642877	9.953413	9.689463	10.310537	9.658037	9.949623	9.708414	10.291586	56
5	9.643135	9.953352	9.689783	10.310217	9.658284	9.949558	9.708726	10.291274	55
6	9.643393	9.953290	9.690103	10.309897	9.658531	9.949494	9.709037	10.290963	54
7	9.643650	9.953228	9.690423	10.309577	9.658778	9.949429	9.709349	10.290651	53
8	9.643908	9.953166	9.690742	10.309258	9.659025	9.949364	9.709660	10.290340	52
9	9.644165	9.953104	9.691062	10.308938	9.659271	9.949300	9.709971	10.290029	51
10	9.644423	9.953042	9.691381	10.308619	9.659517	9.949235	9.710282	10.289718	50
11	9.644680	9.952980	9.691700	10.308300	9.659763	9.949170	9.710593	10.289407	49
12	9.644936	9.952918	9.692019	10.307981	9.660009	9.949105	9.710904	10.289096	48
13	9.645193	9.952855	9.692338	10.307662	9.660255	9.949040	9.711215	10.288785	47
14	9.645450	9.952793	9.692656	10.307344	9.660501	9.948975	9.711525	10.288475	46
15	9.645706	9.952731	9.692975	10.307025	9.660746	9.948910	9.711836	10.288164	45
16	9.645962	9.952669	9.693293	10.306707	9.660991	9.948845	9.712146	10.287854	44
17	9.646218	9.952606	9.693612	10.306388	9.661236	9.948780	9.712456	10.287544	43
18	9.646474	9.952544	9.693930	10.306070	9.661481	9.948715	9.712766	10.287234	42
19	9.646729	9.952481	9.694248	10.305752	9.661726	9.948650	9.713076	10.286924	41
20	9.646984	9.952419	9.694566	10.305434	9.661970	9.948584	9.713386	10.286614	40
21	9.647240	9.952356	9.694883	10.305117	9.662214	9.948519	9.713696	10.286304	39
22	9.647494	9.952294	9.695201	10.304799	9.662459	9.948454	9.714005	10.285995	38
23	9.647749	9.952231	9.695518	10.304482	9.662703	9.948388	9.714314	10.285686	37
24	9.648004	9.952168	9.695836	10.304164	9.662946	9.948323	9.714624	10.285376	36
25	9.648258	9.952106	9.696153	10.303847	9.663190	9.948257	9.714933	10.285067	35
26	9.648512	9.952043	9.696470	10.303530	9.663433	9.948192	9.715242	10.284758	34
27	9.648766	9.951980	9.696787	10.303213	9.663677	9.948126	9.715551	10.284449	33
28	9.649020	9.951917	9.697103	10.302897	9.663920	9.948060	9.715860	10.284140	32
29	9.649274	9.951854	9.697420	10.302580	9.664163	9.947995	9.716168	10.283832	31
30	9.649527	9.951791	9.697736	10.302264	9.664406	9.947929	9.716477	10.283523	30
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	63.				62.				

	26.				27.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
30	9.649527	9.951791	9.697736	10.302264	9.664406	9.947929	9.716477	10.283523	30
31	9.649781	9.951728	9.698053	10.301947	9.664648	9.947863	9.716785	10.283215	29
32	9.650034	9.951665	9.698369	10.301631	9.664891	9.947797	9.717093	10.282907	28
33	9.650287	9.951602	9.698685	10.301315	9.665133	9.947731	9.717401	10.282599	27
34	9.650539	9.951539	9.699001	10.300999	9.665375	9.947665	9.717709	10.282291	26
35	9.650792	9.951476	9.699316	10.300684	9.665617	9.947600	9.718017	10.281983	25
36	9.651044	9.951412	9.699632	10.300368	9.665859	9.947533	9.718325	10.281675	24
37	9.651297	9.951349	9.699947	10.300052	9.666100	9.947467	9.718633	10.281367	23
38	9.651549	9.951286	9.700263	10.299737	9.666342	9.947401	9.718940	10.281060	22
39	9.651800	9.951222	9.700578	10.299422	9.666583	9.947335	9.719248	10.280752	21
40	9.652052	9.951159	9.700893	10.299107	9.666824	9.947269	9.719555	10.280445	20
41	9.652304	9.951096	9.701208	10.298792	9.667065	9.947203	9.719862	10.280138	19
42	9.652555	9.951032	9.701523	10.298477	9.667305	9.947136	9.720169	10.279831	18
43	9.652806	9.950968	9.701837	10.298163	9.667546	9.947070	9.720476	10.279524	17
44	9.653057	9.950905	9.702152	10.297848	9.667786	9.947004	9.720783	10.279217	16
45	9.653308	9.950841	9.702466	10.297534	9.668027	9.946937	9.721089	10.278911	15
46	9.653558	9.950778	9.702781	10.297219	9.668267	9.946871	9.721396	10.278604	14
47	9.653808	9.950714	9.703095	10.296905	9.668506	9.946804	9.721702	10.278298	13
48	9.654059	9.950650	9.703409	10.296591	9.668746	9.946738	9.722009	10.277991	12
49	9.654309	9.950586	9.703722	10.296278	9.668986	9.946671	9.722315	10.277685	11
50	9.654558	9.950522	9.704036	10.295964	9.669225	9.946604	9.722621	10.277379	10
51	9.654808	9.950458	9.704350	10.295650	9.669464	9.946538	9.722927	10.277073	9
52	9.655058	9.950394	9.704663	10.295337	9.669703	9.946471	9.723232	10.276768	8
53	9.655307	9.950330	9.704976	10.295024	9.669942	9.946404	9.723538	10.276462	7
54	9.655556	9.950266	9.705290	10.294710	9.670181	9.946337	9.723844	10.276156	6
55	9.655805	9.950202	9.705603	10.294397	9.670419	9.946270	9.724149	10.275851	5
56	9.656054	9.950138	9.705916	10.294084	9.670658	9.946203	9.724454	10.275546	4
57	9.656302	9.950074	9.706228	10.293772	9.670896	9.946136	9.724760	10.275240	3
58	9.656551	9.950010	9.706541	10.293459	9.671134	9.946069	9.725065	10.274935	2
59	9.656799	9.949945	9.706854	10.293146	9.671372	9.946002	9.725370	10.274630	1
60	9.657047	9.949881	9.707166	10.292834	9.671609	9.945935	9.725674	10.274326	0
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	63.				62.				

M	28 SIN.	Co-sin.	TAN.	Co-tan.	29. SIN.	Co-sin.	TAN.	Co-tan.	
0	9.671609	9.945935	9.725674	10.274326	9.685571	9.941819	9.743751	10.256248	60
1	9.671847	9.945868	9.725979	10.274021	9.685799	9.941749	9.744050	10.255950	59
2	9.672084	9.945800	9.726284	10.273716	9.686027	9.941679	9.744348	10.255652	58
3	9.672321	9.945733	9.726588	10.273412	9.686254	9.941609	9.744645	10.255355	57
4	9.672558	9.945666	9.726892	10.273108	9.686482	9.941539	9.744943	10.255057	56
5	9.672795	9.945598	9.727197	10.272803	9.686709	9.941469	9.745240	10.254760	55
6	9.673032	9.945531	9.727501	10.272499	9.686936	9.941398	9.745538	10.254462	54
7	9.673268	9.945464	9.727805	10.272195	9.687163	9.941328	9.745835	10.254165	53
8	9.673505	9.945396	9.728109	10.271891	9.687389	9.941258	9.746132	10.253868	52
9	9.673741	9.945328	9.728412	10.271588	9.687616	9.941187	9.746429	10.253571	51
10	9.673977	9.945261	9.728716	10.271284	9.687843	9.941117	9.746726	10.253274	50
11	9.674213	9.945193	9.729020	10.270980	9.688069	9.941046	9.747023	10.252977	49
12	9.674448	9.945125	9.729323	10.270677	9.688295	9.940975	9.747319	10.252681	48
13	9.674684	9.945058	9.729626	10.270374	9.688521	9.940905	9.747616	10.252384	47
14	9.674919	9.944990	9.729929	10.270071	9.688747	9.940834	9.747913	10.252087	46
15	9.675155	9.944922	9.730233	10.269767	9.688972	9.940763	9.748209	10.251791	45
16	9.675390	9.944854	9.730535	10.269465	9.689198	9.940693	9.748505	10.251495	44
17	9.675624	9.944786	9.730838	10.269162	9.689423	9.940622	9.748801	10.251199	43
18	9.675859	9.944718	9.731141	10.268859	9.689648	9.940551	9.749097	10.250903	42
19	9.676094	9.944650	9.731444	10.268556	9.689873	9.940480	9.749393	10.250607	41
20	9.676328	9.944582	9.731746	10.268254	9.690098	9.940409	9.749689	10.250311	40
21	9.676562	9.944514	9.732048	10.267952	9.690323	9.940338	9.749985	10.250015	39
22	9.676796	9.944446	9.732351	10.267649	9.690548	9.940267	9.750281	10.249719	38
23	9.677030	9.944377	9.732653	10.267347	9.690772	9.940196	9.750576	10.249424	37
24	9.677264	9.944309	9.732955	10.267045	9.690996	9.940125	9.750872	10.249128	36
25	9.677498	9.944241	9.733257	10.266743	9.691220	9.940054	9.751167	10.248833	35
26	9.677731	9.944172	9.733558	10.266442	9.691444	9.939982	9.751462	10.248538	34
27	9.677964	9.944104	9.733860	10.266140	9.691668	9.939911	9.751757	10.248243	33
28	9.678197	9.944036	9.734162	10.265838	9.691892	9.939840	9.752052	10.247948	32
29	9.678430	9.943967	9.734463	10.265537	9.692115	9.939768	9.752347	10.247653	31
30	9.678663	9.943899	9.734764	10.265236	9.692339	9.939697	9.752642	10.247358	30
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	61.				60.				

	28.				29.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
30	9.678663	9.943899	9.734764	10.265236	9.692339	9.939697	9.752642	10.247358	30
31	9.678895	9.943830	9.735066	10.264934	9.692562	9.939625	9.752937	10.247063	29
32	9.679128	9.943761	9.735367	10.264633	9.692785	9.939554	9.753231	10.246769	28
33	9.679360	9.943693	9.735668	10.264332	9.693008	9.939482	9.753526	10.246474	27
34	9.679592	9.943624	9.735969	10.264031	9.693231	9.939410	9.753820	10.246180	26
35	9.679824	9.943555	9.736269	10.263731	9.693453	9.939339	9.754115	10.245885	25
36	9.680056	9.943486	9.736570	10.263430	9.693676	9.939267	9.754409	10.245591	24
37	9.680288	9.943417	9.736870	10.263130	9.693898	9.939195	9.754703	10.245297	23
38	9.680519	9.943348	9.737171	10.262829	9.694120	9.939123	9.754997	10.245003	22
39	9.680750	9.943279	9.737471	10.262529	9.694342	9.939052	9.755261	10.244709	21
40	9.680982	9.943210	9.737771	10.262229	9.694564	9.938980	9.755585	10.244415	20
41	9.681213	9.943141	9.738071	10.261929	9.694786	9.938908	9.755878	10.244122	19
42	9.681443	9.943072	9.738371	10.261629	9.695007	9.938836	9.756172	10.243828	18
43	9.681674	9.943003	9.738671	10.261329	9.695229	9.938763	9.756465	10.243535	17
44	9.681905	9.942934	9.738971	10.261029	9.695450	9.938691	9.756759	10.243241	16
45	9.682135	9.942864	9.739271	10.260729	9.695671	9.938619	9.757052	10.242948	15
46	9.682365	9.942795	9.739570	10.260430	9.695892	9.938547	9.757345	10.242655	14
47	9.682595	9.942726	9.739870	10.260130	9.696113	9.938475	9.757638	10.242362	13
48	9.682825	9.942656	9.740169	10.259831	9.696334	9.938402	9.757931	10.242069	12
49	9.683055	9.942587	9.740468	10.259532	9.696554	9.938330	9.758224	10.241776	11
50	9.683284	9.942517	9.740767	10.259233	9.696775	9.938258	9.758517	10.241483	10
51	9.683514	9.942448	9.741066	10.258934	9.696995	9.938185	9.758810	10.241190	9
52	9.683743	9.942378	9.741365	10.258635	9.697215	9.938113	9.759102	10.240898	8
53	9.683972	9.942308	9.741664	10.258336	9.697435	9.938040	9.759395	10.240605	7
54	9.684201	9.942239	9.741962	10.258038	9.697654	9.937967	9.759687	10.240313	6
55	9.684430	9.942169	9.742261	10.257739	9.697874	9.937895	9.759979	10.240021	5
56	9.684658	9.942099	9.742559	10.257441	9.698094	9.937822	9.760272	10.239728	4
57	9.684887	9.942029	9.742858	10.257142	9.698313	9.937749	9.760564	10.239436	3
58	9.685115	9.941959	9.743156	10.256844	9.698532	9.937676	9.760856	10.239144	2
59	9.685343	9.941889	9.743454	10.256546	9.698751	9.937604	9.761148	10.238852	1
60	9.685571	9.941819	9.743752	10.256248	9.698970	9.937531	9.761439	10.238561	0
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	61.				60.				

	30				31.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
0	9.698970	9.937531	9.761439	10.238561	9.711839	9.933066	9.778774	10.221226	60
1	9.699189	9.937458	9.761731	10.238269	9.712050	9.932990	9.779060	10.220940	59
2	9.699407	9.937385	9.762023	10.237977	9.712260	9.932914	9.779346	10.220654	58
3	9.699626	9.937312	9.762314	10.237686	9.712469	9.932838	9.779632	10.220368	57
4	9.699844	9.937238	9.762606	10.237394	9.712679	9.932762	9.779918	10.220082	56
5	9.700062	9.937165	9.762897	10.237103	9.712889	9.932685	9.780203	10.219797	55
6	9.700280	9.937092	9.763188	10.236812	9.713098	9.932609	9.780489	10.219511	54
7	9.700498	9.937019	9.763479	10.236521	9.713308	9.932533	9.780775	10.219225	53
8	9.700716	9.936946	9.763770	10.236230	9.713517	9.932457	9.781060	10.218940	52
9	9.700933	9.936872	9.764061	10.235939	9.713726	9.932380	9.781346	10.218654	51
10	9.701151	9.936799	9.764352	10.235648	9.713935	9.932304	9.781631	10.218369	50
11	9.701368	9.936725	9.764643	10.235357	9.714144	9.932228	9.781916	10.218084	49
12	9.701585	9.936652	9.764933	10.235067	9.714352	9.932151	9.782201	10.217799	48
13	9.701802	9.936578	9.765224	10.234776	9.714561	9.932075	9.782486	10.217514	47
14	9.702019	9.936505	9.765514	10.234486	9.714769	9.931998	9.782771	10.217229	46
15	9.702236	9.936431	9.765805	10.234195	9.714978	9.931921	9.783056	10.216944	45
16	9.702452	9.936357	9.766095	10.233905	9.715186	9.931845	9.783341	10.216659	44
17	9.702669	9.936284	9.766385	10.233615	9.715394	9.931768	9.783626	10.216374	43
18	9.702885	9.936210	9.766675	10.233325	9.715602	9.931691	9.783910	10.216090	42
19	9.703101	9.936136	9.766965	10.233035	9.715809	9.931614	9.784195	10.215805	41
20	9.703317	9.936062	9.767255	10.232745	9.716017	9.931537	9.784479	10.215521	40
21	9.703533	9.935988	9.767545	10.232455	9.716224	9.931460	9.784764	10.215236	39
22	9.703749	9.935914	9.767834	10.232166	9.716432	9.931383	9.785048	10.214952	38
23	9.703964	9.935840	9.768124	10.231876	9.716639	9.931306	9.785332	10.214668	37
24	9.704179	9.935766	9.768414	10.231586	9.716846	9.931229	9.785616	10.214384	36
25	9.704395	9.935692	9.768703	10.231297	9.717053	9.931152	9.785900	10.214100	35
26	9.704610	9.935618	9.768992	10.231008	9.717259	9.931075	9.786184	10.213816	34
27	9.704825	9.935543	9.769281	10.230719	9.717466	9.930998	9.786468	10.213532	33
28	9.705040	9.935469	9.769571	10.230429	9.717673	9.930921	9.786752	10.213248	32
29	9.705254	9.935395	9.769860	10.230140	9.717879	9.930843	9.787036	10.212964	31
30	9.705469	9.935320	9.770148	10.229852	9.718085	9.930766	9.787319	10.212681	30
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	59.				58.				

30.						31.				
M	SIN.	Co-sin.	TAN.	Co-tan.		SIN.	Co-sin.	TAN.	Co-tan.	
30	9.705469	9.935320	9.770148	10.229852		9.718085	9.930766	9.787319	10.212681	30
31	9.705683	9.935246	9.770437	10.229563		9.718291	9.930688	9.787603	10.212397	29
32	9.705898	9.935171	9.770726	10.229274		9.718497	9.930611	9.787886	10.212114	28
33	9.706112	9.935097	9.771015	10.228985		9.718703	9.930533	9.788170	10.211830	27
34	9.706326	9.935022	9.771303	10.228697		9.718909	9.930456	9.788453	10.211547	26
35	9.706539	9.934948	9.771592	10.228408		9.719114	9.930378	9.788736	10.211264	25
36	9.706753	9.934873	9.771880	10.228120		9.719320	9.930300	9.789019	10.210981	24
37	9.706967	9.934798	9.772168	10.227832		9.719525	9.930223	9.789302	10.210698	23
38	9.707180	9.934723	9.772457	10.227543		9.719730	9.930145	9.789585	10.210415	22
39	9.707393	9.934649	9.772745	10.227255		9.719935	9.930067	9.789868	10.210132	21
40	9.707606	9.934574	9.773033	10.226967		9.720140	9.929989	9.790151	10.209849	20
41	9.707819	9.934499	9.773321	10.226679		9.720345	9.929911	9.790434	10.209566	19
42	9.708032	9.934424	9.773608	10.226392		9.720549	9.929833	9.790716	10.209284	18
43	9.708245	9.934349	9.773896	10.226104		9.720754	9.929755	9.790999	10.209001	17
44	9.708458	9.934274	9.774184	10.225816		9.720958	9.929677	9.791281	10.208719	16
45	9.708670	9.934199	9.774471	10.225529		9.721162	9.929599	9.791563	10.208437	15
46	9.708882	9.934123	9.774759	10.225241		9.721366	9.929521	9.791846	10.208154	14
47	9.709094	9.934048	9.775046	10.224954		9.721570	9.929442	9.792128	10.207872	13
48	9.709306	9.933973	9.775333	10.224667		9.721774	9.929364	9.792410	10.207590	12
49	9.709518	9.933898	9.775621	10.224379		9.721978	9.929286	9.792692	10.207308	11
50	9.709730	9.933822	9.775908	10.224092		9.722181	9.929207	9.792974	10.207026	10
51	9.709941	9.933747	9.776195	10.223805		9.722385	9.929129	9.793256	10.206744	9
52	9.710153	9.933671	9.776482	10.223518		9.722588	9.929050	9.793538	10.206462	8
53	9.710364	9.933596	9.776768	10.223232		9.722791	9.928972	9.793819	10.206181	7
54	9.710575	9.933520	9.777055	10.222945		9.722994	9.928893	9.794101	10.205899	6
55	9.710786	9.933445	9.777342	10.222658		9.723197	9.928815	9.794383	10.205617	5
56	9.710997	9.933369	9.777628	10.222372		9.723400	9.928736	9.794664	10.205336	4
57	9.711208	9.933293	9.777915	10.222085		9.723603	9.928657	9.794946	10.205054	3
58	9.711419	9.933217	9.778201	10.221799		9.723805	9.928578	9.795227	10.204773	2
59	9.711629	9.933141	9.778488	10.221512		9.724007	9.928499	9.795508	10.204492	1
60	9.711839	9.933066	9.778774	10.221226		9.724210	9.928420	9.795789	10.204211	0
	Co-sin.	SIN.	Co-tan.	TAN.		Co-sin.	SIN.	Co-tan.	TAN.	M
59.						58.				

M	32. SIN.	32. Co-sin.	32. TAN.	32. Co-tan.	33. SIN.	33. Co-sin.	33. TAN.	33. Co-tan.	
0	9.724210	9.928420	9.795789	10.204211	9.736109	9.923591	9.812517	10.187483	60
1	9.724412	9.928342	9.796070	10.203930	9.736303	9.923509	9.812794	10.187206	59
2	9.724614	9.928263	9.796351	10.203649	9.736498	9.923427	9.813070	10.186930	58
3	9.724816	9.928183	9.796632	10.203368	9.736692	9.923345	9.813347	10.186653	57
4	9.725017	9.928104	9.796913	10.203087	9.736886	9.923263	9.813623	10.186377	56
5	9.725219	9.928025	9.797194	10.202806	9.737080	9.923181	9.813899	10.186101	55
6	9.725420	9.927946	9.797474	10.202526	9.737274	9.923098	9.814176	10.185824	54
7	9.725622	9.927867	9.797755	10.202245	9.737467	9.923016	9.814452	10.185548	53
8	9.725823	9.927787	9.798036	10.201964	9.737661	9.922933	9.814728	10.185272	52
9	9.726024	9.927708	9.798316	10.201684	9.737855	9.922851	9.815004	10.184996	51
10	9.726225	9.927629	9.798596	10.201404	9.738048	9.922768	9.815280	10.184720	50
11	9.726426	9.927549	9.798877	10.201123	9.738241	9.922686	9.815555	10.184445	49
12	9.726626	9.927470	9.799157	10.200843	9.738434	9.922603	9.815831	10.184169	48
13	9.726827	9.927390	9.799437	10.200563	9.738627	9.922520	9.816107	10.183893	47
14	9.727027	9.927310	9.799717	10.200283	9.738820	9.922438	9.816382	10.183618	46
15	9.727228	9.927231	9.799997	10.200003	9.739013	9.922355	9.816658	10.183342	45
16	9.727428	9.927151	9.800277	10.199723	9.739206	9.922272	9.816933	10.183067	44
17	9.727628	9.927071	9.800557	10.199443	9.739398	9.922189	9.817209	10.182791	43
18	9.727828	9.926991	9.800836	10.199164	9.739590	9.922106	9.817484	10.182516	42
19	9.728027	9.926911	9.801116	10.198884	9.739783	9.922023	9.817759	10.182241	41
20	9.728227	9.926831	9.801396	10.198604	9.739975	9.921940	9.818035	10.181965	40
21	9.728427	9.926751	9.801675	10.198325	9.740167	9.921857	9.818310	10.181690	39
22	9.728626	9.926671	9.801955	10.198045	9.740359	9.921774	9.818585	10.181415	38
23	9.728825	9.926591	9.802234	10.197766	9.740550	9.921691	9.818860	10.181140	37
24	9.729024	9.926511	9.802513	10.197487	9.740742	9.921607	9.819135	10.180865	36
25	9.729223	9.926431	9.802792	10.197208	9.740934	9.921524	9.819410	10.180590	35
26	9.729422	9.926351	9.803072	10.196928	9.741125	9.921441	9.819684	10.180316	34
27	9.729621	9.926270	9.803351	10.196649	9.741316	9.921357	9.819959	10.180041	33
28	9.729820	9.926190	9.803630	10.196370	9.741508	9.921274	9.820234	10.179766	32
29	9.730018	9.926110	9.803909	10.196091	9.741699	9.921190	9.820508	10.179492	31
30	9.730217	9.926029	9.804187	10.195813	9.741889	9.921107	9.820783	10.179217	30
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	57.				56.				

	32.				33.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
30	9.730217	9.926029	9.804187	10.195813	9.741889	9.921107	9.820783	10.179217	30
31	9.730415	9.925949	9.804466	10.195534	9.742080	9.921023	9.821057	10.178943	29
32	9.730613	9.925868	9.804745	10.195255	9.742271	9.920939	9.821332	10.178668	28
33	9.730811	9.925788	9.805023	10.194977	9.742462	9.920856	9.821606	10.178394	27
34	9.731009	9.925707	9.805302	10.194698	9.742652	9.920772	9.821880	10.178120	26
35	9.731206	9.925626	9.805580	10.194420	9.742842	9.920688	9.822154	10.177846	25
36	9.731404	9.925545	9.805859	10.194141	9.743033	9.920604	9.822429	10.177571	24
37	9.731602	9.925465	9.806137	10.193863	9.743223	9.920520	9.822703	10.177297	23
38	9.731799	9.925384	9.806415	10.193585	9.743413	9.920436	9.822977	10.177023	22
39	9.731996	9.925303	9.806693	10.193307	9.743602	9.920352	9.823251	10.176739	21
40	9.732193	9.925222	9.806971	10.193029	9.743792	9.920268	9.823524	10.176476	20
41	9.732390	9.925141	9.807249	10.192751	9.743982	9.920184	9.823798	10.176202	19
42	9.732587	9.925060	9.807527	10.192473	9.744171	9.920099	9.824072	10.175928	18
43	9.732784	9.924979	9.807805	10.192195	9.744361	9.920015	9.824345	10.175655	17
44	9.732980	9.924897	9.808083	10.191917	9.744550	9.919931	9.824619	10.175381	16
45	9.733177	9.924816	9.808361	10.191639	9.744739	9.919846	9.824893	10.175107	15
46	9.733373	9.924735	9.808638	10.191362	9.744928	9.919762	9.825166	10.174834	14
47	9.733569	9.924654	9.808916	10.191084	9.745117	9.919677	9.825439	10.174561	13
48	9.733765	9.924572	9.809193	10.190807	9.745306	9.919593	9.825713	10.174287	12
49	9.733961	9.924491	9.809471	10.190529	9.745494	9.919508	9.825986	10.174014	11
50	9.734157	9.924409	9.809748	10.190252	9.745683	9.919424	9.826259	10.173741	10
51	9.734353	9.924328	9.810025	10.189975	9.745871	9.919339	9.826532	10.173468	9
52	9.734549	9.924246	9.810302	10.189698	9.746060	9.919254	9.826805	10.173195	8
53	9.734744	9.924164	9.810580	10.189420	9.746248	9.919169	9.827078	10.172922	7
54	9.734939	9.924083	9.810857	10.189143	9.746436	9.919085	9.827351	10.172649	6
55	9.735135	9.924001	9.811134	10.188866	9.746624	9.919000	9.827624	10.172376	5
56	9.735330	9.923919	9.811410	10.188590	9.746812	9.918915	9.827897	10.172103	4
57	9.735525	9.923837	9.811687	10.188319	9.746999	9.918830	9.828170	10.171830	3
58	9.735719	9.923755	9.811964	10.188036	9.747187	9.918745	9.828442	10.171558	2
59	9.735914	9.923673	9.812241	10.187759	9.747374	9.918659	9.828715	10.171285	1
60	9.736109	9.923591	9.812517	10.187483	9.747562	9.918574	9.828987	10.171013	0
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	57.				56.				

	34.				35.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
0	9.747562	9.918574	9.828987	10.171013	9.758591	9.913365	9.845227	10.154773	60
1	9.747749	9.918489	9.829260	10.170740	9.758772	9.913276	9.845496	10.154504	59
2	9.747936	9.918404	9.829532	10.170468	9.758952	9.913187	9.845764	10.154236	58
3	9.748123	9.918318	9.829805	10.170195	9.759132	9.913099	9.846033	10.153967	57
4	9.748310	9.918233	9.830077	10.169923	9.759312	9.913010	9.846302	10.153698	56
5	9.748497	9.918147	9.830349	10.169651	9.759492	9.912922	9.846570	10.153430	55
6	9.748683	9.918062	9.830621	10.169379	9.759672	9.912833	9.846839	10.153161	54
7	9.748870	9.917976	9.830893	10.169107	9.759852	9.912744	9.847108	10.152892	53
8	9.749056	9.917891	9.831165	10.168835	9.760031	9.912655	9.847376	10.152624	52
9	9.749243	9.917805	9.831437	10.168563	9.760211	9.912566	9.847644	10.152356	51
10	9.749429	9.917719	9.831709	10.168291	9.760390	9.912477	9.847913	10.152087	50
11	9.749615	9.917634	9.831981	10.168019	9.760569	9.912388	9.848181	10.151819	49
12	9.749801	9.917548	9.832253	10.167747	9.760748	9.912299	9.848449	10.151551	48
13	9.749987	9.917462	9.832525	10.167475	9.760927	9.912210	9.848717	10.151283	47
14	9.750172	9.917376	9.832796	10.167204	9.761106	9.912121	9.848986	10.151014	46
15	9.750358	9.917290	9.833068	10.166932	9.761285	9.912031	9.849254	10.150746	45
16	9.750543	9.917204	9.833339	10.166661	9.761464	9.911942	9.849522	10.150478	44
17	9.750729	9.917118	9.833611	10.166389	9.761642	9.911853	9.849790	10.150210	43
18	9.750914	9.917032	9.833882	10.166118	9.761821	9.911763	9.850057	10.149943	42
19	9.751099	9.916946	9.834154	10.165846	9.761999	9.911674	9.850325	10.149675	41
20	9.751284	9.916859	9.834425	10.165575	9.762177	9.911584	9.850593	10.149407	40
21	9.751469	9.916773	9.834696	10.165304	9.762356	9.911495	9.850861	10.149139	39
22	9.751654	9.916687	9.834967	10.165033	9.762534	9.911405	9.851129	10.148871	38
23	9.751839	9.916600	9.835238	10.164762	9.762712	9.911315	9.851396	10.148604	37
24	9.752023	9.916514	9.835509	10.164491	9.762889	9.911226	9.851664	10.148336	36
25	9.752208	9.916427	9.835780	10.164220	9.763067	9.911136	9.851931	10.148069	35
26	9.752392	9.916341	9.836051	10.163949	9.763245	9.911046	9.852199	10.147801	34
27	9.752576	9.916254	9.836322	10.163678	9.763422	9.910956	9.852466	10.147534	33
28	9.752760	9.916167	9.836593	10.163407	9.763600	9.910866	9.852733	10.147267	32
29	9.752944	9.916081	9.836864	10.163136	9.763777	9.910776	9.853001	10.146999	31
30	9.753128	9.915994	9.837134	10.162866	9.763954	9.910686	9.853268	10.146732	30
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	55.				54.				

	34.				35.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
30	9.753128	9.915994	9.837134	10.162866	9.763954	9.910686	9.853268	10.146732	30
31	9.753312	9.915907	9.837405	10.162595	9.764131	9.910596	9.853535	10.146465	29
32	9.753495	9.915820	9.837675	10.162325	9.764308	9.910506	9.853802	10.146198	28
33	9.753679	9.915733	9.837946	10.162054	9.764485	9.910415	9.854069	10.145931	27
34	9.753862	9.915646	9.838216	10.161784	9.764662	9.910325	9.854336	10.145664	26
35	9.754046	9.915559	9.838487	10.161513	9.764838	9.910235	9.854603	10.145397	25
36	9.754229	9.915472	9.838757	10.161243	9.765015	9.910144	9.854870	10.145130	24
37	9.754412	9.915385	9.839027	10.160973	9.765191	9.910054	9.855137	10.144863	23
38	9.754595	9.915297	9.839297	10.160703	9.765367	9.909963	9.855404	10.144596	22
39	9.754778	9.915210	9.839568	10.160432	9.765544	9.909873	9.855671	10.144329	21
40	9.754960	9.915123	9.839838	10.160162	9.765720	9.909782	9.855938	10.144062	20
41	9.755143	9.915035	9.840108	10.159892	9.765896	9.909691	9.856204	10.143796	19
42	9.755326	9.914948	9.840378	10.159622	9.766072	9.909601	9.856471	10.143529	18
43	9.755508	9.914860	9.840648	10.159352	9.766247	9.909510	9.856737	10.143263	17
44	9.755690	9.914773	9.840917	10.159083	9.766423	9.909419	9.857004	10.142996	16
45	9.755872	9.914685	9.841187	10.158813	9.766598	9.909328	9.857270	10.142730	15
46	9.756054	9.914598	9.841457	10.158543	9.766774	9.909237	9.857537	10.142463	14
47	9.756236	9.914510	9.841727	10.158273	9.766949	9.909146	9.857803	10.142197	13
48	9.756418	9.914422	9.841996	10.158004	9.767124	9.909055	9.858069	10.141931	12
49	9.756600	9.914334	9.842266	10.157734	9.767300	9.908964	9.858336	10.141664	11
50	9.756782	9.914246	9.842535	10.157465	9.767475	9.908873	9.858602	10.141398	10
51	9.756963	9.914158	9.842805	10.157195	9.767649	9.908781	9.858868	10.141132	9
52	9.757144	9.914070	9.843074	10.156926	9.767824	9.908690	9.859134	10.140866	8
53	9.757326	9.913982	9.843343	10.156657	9.767999	9.908599	9.859400	10.140600	7
54	9.757507	9.913894	9.843612	10.156388	9.768173	9.908507	9.859666	10.140334	6
55	9.757688	9.913806	9.843882	10.156118	9.768348	9.908416	9.859932	10.140068	5
56	9.757869	9.913718	9.844151	10.155849	9.768522	9.908324	9.860198	10.139802	4
57	9.758050	9.913630	9.844420	10.155580	9.768697	9.908233	9.860464	10.139536	3
58	9.758230	9.913541	9.844689	10.155311	9.768871	9.908141	9.860730	10.139270	2
59	9.758411	9.913453	9.844958	10.155042	9.769045	9.908049	9.860995	10.139005	1
60	9.758591	9.913365	9.845227	10.154773	9.769219	9.907958	9.861261	10.138739	0
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	55.				54.				

	36				37.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
0	9·769219	9·907958	9·861261	10·138739	9·779463	9·902349	9·877114	10·122886	60
1	9·769393	9·907866	9·861527	10·138473	9·779631	9·902253	9·877377	10·122623	59
2	9·769566	9·907774	9·861792	10·138208	9·779798	9·902158	9·877640	10·122360	58
3	9·769740	9·907682	9·862058	10·137942	9·779966	9·902063	9·877903	10·122097	57
4	9·769913	9·907590	9·862323	10·137677	9·780133	9·901967	9·878165	10·121835	56
5	9·770087	9·907498	9·862589	10·137411	9·780300	9·901872	9·878428	10·121572	55
6	9·770260	9·907406	9·862854	10·137146	9·780467	9·901776	9·878691	10·121309	54
7	9·770433	9·907314	9·863119	10·136881	9·780634	9·901681	9·878953	10·121047	53
8	9·770606	9·907222	9·863385	10·136615	9·780801	9·901585	9·879216	10·120784	52
9	9·770779	9·907129	9·863650	10·136350	9·780968	9·901490	9·879478	10·120522	51
10	9·770952	9·907037	9·863915	10·136085	9·781134	9·901394	9·879741	10·120259	50
11	9·771125	9·906945	9·864180	10·135820	9·781301	9·901298	9·880003	10·119997	49
12	9·771298	9·906852	9·864445	10·135555	9·781468	9·901202	9·880265	10·119735	48
13	9·771470	9·906760	9·864710	10·135290	9·781634	9·901106	9·880528	10·119472	47
14	9·771643	9·906667	9·864975	10·135025	9·781800	9·901010	9·880790	10·119210	46
15	9·771815	9·906575	9·865240	10·134760	9·781966	9·900914	9·881052	10·118948	45
16	9·771987	9·906482	9·865505	10·134495	9·782132	9·900828	9·881314	10·118686	44
17	9·772159	9·906389	9·865770	10·134230	9·782298	9·900722	9·881577	10·118423	43
18	9·772331	9·906296	9·866035	10·133965	9·782464	9·900626	9·881839	10·118161	42
19	9·772503	9·906204	9·866300	10·133700	9·782630	9·900529	9·882101	10·117899	41
20	9·772675	9·906111	9·866564	10·133436	9·782796	9·900433	9·882363	10·117637	40
21	9·772847	9·906018	9·866829	10·133171	9·782961	9·900337	9·882625	10·117375	39
22	9·773018	9·905925	9·867094	10·132906	9·783127	9·900240	9·882887	10·117113	38
23	9·773190	9·905832	9·867358	10·132642	9·783292	9·900144	9·883148	10·116852	37
24	9·773361	9·905739	9·867623	10·132377	9·783458	9·900047	9·883410	10·116590	36
25	9·773533	9·905645	9·867887	10·132133	9·783623	9·899951	9·883672	10·116328	35
26	9·773704	9·905552	9·868152	10·131848	9·783788	9·899854	9·883934	10·116066	34
27	9·773875	9·905459	9·868416	10·131584	9·783953	9·899757	9·884196	10·115804	33
28	9·774046	9·905366	9·868680	10·131320	9·784118	9·899660	9·884457	10·115543	32
29	9·774217	9·905272	9·868945	10·131055	9·784282	9·899564	9·884719	10·115281	31
30	9·774388	9·905179	9·869209	10·130791	9·784447	9·899467	9·884980	10·115020	30
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	53.				52.				

	36.				37.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
30	9.774388	9.905179	9.869209	10.130791	9.784447	9.899467	9.884980	10.115020	30
31	9.774558	9.905085	9.869473	10.130527	9.784612	9.899370	9.885242	10.114758	29
32	9.774729	9.904992	9.869737	10.130263	9.784776	9.899273	9.885504	10.114496	28
33	9.774899	9.904898	9.870001	10.129999	9.784941	9.899176	9.885765	10.114235	27
34	9.775070	9.904804	9.870265	10.129735	9.785105	9.899078	9.886026	10.113974	26
35	9.775240	9.904711	9.870529	10.129471	9.785269	9.898981	9.886288	10.113712	25
36	9.775410	9.904617	9.870793	10.129207	9.785433	9.898884	9.886549	10.113451	24
37	9.775580	9.904523	9.871057	10.128943	9.785597	9.898787	9.886811	10.113189	23
38	9.775750	9.904429	9.871321	10.128679	9.785761	9.898689	9.887072	10.112928	22
39	9.775920	9.904335	9.871585	10.128415	9.785925	9.898592	9.887333	10.112667	21
40	9.776090	9.904241	9.871849	10.128151	9.786089	9.898494	9.887594	10.112406	20
41	9.776259	9.904147	9.872112	10.127888	9.786252	9.898397	9.887855	10.112145	19
42	9.776429	9.904053	9.872376	10.127624	9.786416	9.898299	9.888116	10.111884	18
43	9.776598	9.903959	9.872640	10.127360	9.786579	9.898202	9.888378	10.111622	17
44	9.776768	9.903864	9.872903	10.127097	9.786742	9.898104	9.888639	10.111361	16
45	9.776937	9.903770	9.873167	10.126833	9.786906	9.898006	9.888900	10.111100	15
46	9.777106	9.903676	9.873430	10.126570	9.787069	9.897908	9.889161	10.110839	14
47	9.777275	9.903581	9.873694	10.126306	9.787232	9.897810	9.889421	10.110579	13
48	9.777444	9.903487	9.873957	10.126043	9.787395	9.897712	9.889682	10.110318	12
49	9.777613	9.903392	9.874220	10.125780	9.787557	9.897614	9.889943	10.110057	11
50	9.777781	9.903298	9.874484	10.125516	9.787720	9.897516	9.890204	10.109796	10
51	9.777950	9.903203	9.874747	10.125253	9.787883	9.897418	9.890465	10.109535	9
52	9.778119	9.903108	9.875010	10.124990	9.788045	9.897320	9.890725	10.109275	8
53	9.778287	9.903014	9.875273	10.124727	9.788208	9.897222	9.890986	10.109014	7
54	9.778455	9.902919	9.875537	10.124463	9.788370	9.897123	9.891247	10.108753	6
55	9.778624	9.902824	9.875800	10.124200	9.788532	9.897025	9.891507	10.108493	5
56	9.778792	9.902729	9.876063	10.123937	9.788694	9.896926	9.891768	10.108232	4
57	9.778960	9.902634	9.876326	10.123674	9.788856	9.896828	9.892028	10.107972	3
58	9.779128	9.902539	9.876589	10.123411	9.789018	9.896729	9.892289	10.107711	2
59	9.779295	9.902444	9.876852	10.123148	9.789180	9.896631	9.892549	10.107451	1
60	9.779463	9.902349	9.877114	10.122886	9.789342	9.896532	9.892810	10.107190	0
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	53.				52.				

	38				39.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
0	9.789342	9.896532	9.892810	10.107190	9.798872	9.890503	9.908369	10.091631	60
1	9.789504	9.896433	9.893070	10.106930	9.799028	9.890400	9.908628	10.091372	59
2	9.789665	9.896335	9.893331	10.106669	9.799184	9.890298	9.908886	10.091114	58
3	9.789827	9.896236	9.893591	10.106409	9.799339	9.890195	9.909144	10.090856	57
4	9.789988	9.896137	9.893851	10.106149	9.799495	9.890093	9.909402	10.090598	56
5	9.790149	9.896038	9.894111	10.105889	9.799651	9.889990	9.909660	10.090340	55
6	9.790310	9.895939	9.894372	10.105628	9.799806	9.889888	9.909918	10.090082	54
7	9.790471	9.895840	9.894632	10.105368	9.799962	9.889785	9.910177	10.089823	53
8	9.790632	9.895741	9.894892	10.105108	9.800117	9.889682	9.910435	10.089565	52
9	9.790793	9.895641	9.895152	10.104848	9.800272	9.889579	9.910693	10.089307	51
10	9.790954	9.895542	9.895412	10.104588	9.800427	9.889477	9.910951	10.089049	50
11	9.791115	9.895443	9.895672	10.104328	9.800582	9.889374	9.911209	10.088791	49
12	9.791275	9.895343	9.895932	10.104068	9.800737	9.889271	9.911467	10.088533	48
13	9.791436	9.895244	9.896192	10.103808	9.800892	9.889168	9.911725	10.088275	47
14	9.791596	9.895145	9.896452	10.103548	9.801047	9.889064	9.911982	10.088018	46
15	9.791757	9.895045	9.896712	10.103288	9.801201	9.888961	9.912240	10.087760	45
16	9.791917	9.894945	9.896971	10.103029	9.801356	9.888858	9.912498	10.087502	44
17	9.792077	9.894846	9.897231	10.102769	9.801511	9.888755	9.912756	10.087244	43
18	9.792237	9.894746	9.897491	10.102509	9.801665	9.888651	9.913014	10.086986	42
19	9.792397	9.894646	9.897751	10.102249	9.801819	9.888548	9.913271	10.086729	41
20	9.792557	9.894546	9.898010	10.101990	9.801973	9.888444	9.913529	10.086471	40
21	9.792716	9.894446	9.898270	10.101730	9.802128	9.888341	9.913787	10.086213	39
22	9.792876	9.894346	9.898530	10.101470	9.802282	9.888237	9.914044	10.085956	38
23	9.793035	9.894246	9.898789	10.101211	9.802436	9.888134	9.914302	10.085698	37
24	9.793195	9.894146	9.899049	10.100951	9.802589	9.888030	9.914560	10.085440	36
25	9.793354	9.894046	9.899308	10.100692	9.802743	9.887926	9.914817	10.085183	35
26	9.793514	9.893946	9.899568	10.100432	9.802897	9.887822	9. 15075	10.084925	34
27	9.793673	9.893846	9.899827	10.100173	9.803050	9.887718	9.915332	10.084668	33
28	9.793832	9.893745	9.900087	10.099913	9.803204	9.887614	9.915590	10.084410	32
29	9.793991	9.893645	9.900346	10.099654	9.803357	9.887510	9.915847	10.084153	31
30	9.794150	9.893544	9.900605	10.099395	9.803511	9.887406	9.916104	10.083895	30
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	51.				50.				

	38.				39.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
30	9.794150	9.893544	9.900605	10.099395	9.803511	9.887406	9.916104	10.083895	30
31	9.794308	9.893444	9.900864	10.099136	9.803664	9.887302	9.916362	10.083638	29
32	9.794467	9.893343	9.901124	10.098876	9.803817	9.887198	9.916619	10.083381	28
33	9.794626	9.893243	9.901383	10.098617	9.803970	9.887093	9.916877	10.083123	27
34	9.794784	9.893142	9.901642	10.098358	9.804123	9.886989	9.917134	10.082866	26
35	9.794942	9.893041	9.901901	10.098099	9.804276	9.886885	9.917391	10.082609	25
36	9.795101	9.892940	9.902160	10.097840	9.804428	9.886780	9.917648	10.082352	24
37	9.795259	9.892839	9.902420	10.097580	9.804581	9.886676	9.917906	10.082094	23
38	9.795417	9.892739	9.902679	10.097321	9.804734	9.886571	9.918163	10.081837	22
39	9.795575	9.892638	9.902938	10.097062	9.804886	9.886466	9.918420	10.081580	21
40	9.795733	9.892536	9.903197	10.096803	9.805039	9.886362	9.918677	10.081323	20
41	9.795891	9.892435	9.903456	10.096544	9.805191	9.886257	9.918934	10.081066	19
42	9.796049	9.892334	9.903714	10.096286	9.805343	9.886152	9.919191	10.080809	18
43	9.796206	9.892233	9.903973	10.096027	9.805495	9.886047	9.919448	10.080552	17
44	9.796364	9.892132	9.904232	10.095768	9.805647	9.885942	9.919705	10.080295	16
45	9.796521	9.892030	9.904491	10.095509	9.805799	9.885837	9.919962	10.080038	15
46	9.796679	9.891929	9.904750	10.095250	9.805951	9.885732	9.920219	10.079781	14
47	9.796836	9.891827	9.905008	10.094992	9.806103	9.885627	9.920476	10.079524	13
48	9.796993	9.891726	9.905267	10.094733	9.806254	9.885522	9.920733	10.079267	12
49	9.797150	9.891624	9.905526	10.094474	9.806406	9.885416	9.920990	10.079010	11
50	9.797307	9.891523	9.905785	10.094215	9.806557	9.885311	9.921247	10.078753	10
51	9.797464	9.891421	9.906043	10.093957	9.806709	9.885205	9.921503	10.078497	9
52	9.797621	9.891319	9.906302	10.093698	9.806860	9.885100	9.921760	10.078240	8
53	9.797777	9.891217	9.906560	10.093440	9.807011	9.884994	9.922017	10.077983	7
54	9.797934	9.891115	9.906819	10.093181	9.807163	9.884889	9.922274	10.077726	6
55	9.798091	9.891013	9.907077	10.092923	9.807314	9.884783	9.922530	10.077470	5
56	9.798247	9.890911	9.907336	10.092664	9.807465	9.884677	9.922787	10.077213	4
57	9.798403	9.890809	9.907594	10.092406	9.807615	9.884572	9.923044	10.076956	3
58	9.798560	9.890707	9.907853	10.092147	9.807766	9.884466	9.923300	10.076700	2
59	9.798716	9.890605	9.908111	10.091889	9.807917	9.884360	9.923557	10.076443	1
60	9.798872	9.890503	9.908369	10.091631	9.808067	9.884254	9.923814	10.076186	0
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	51.				50.				

Canon Triangulorum Logarithmicus.

	40				41.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
0	9.808067	9.884254	9.923814	10.076186	9.816943	9.877780	9.939163	10.060837	60
1	9.808218	9.884148	9.924070	10.075930	9.817088	9.877670	9.939418	10.060582	59
2	9.808368	9.884042	9.924327	10.075673	9.817233	9.877560	9.939673	10.060327	58
3	9.808519	9.883936	9.924583	10.075417	9.817379	9.877450	9.939928	10.060072	57
4	9.808669	9.883829	9.924840	10.075160	9.817524	9.877340	9.940183	10.059817	56
5	9.808819	9.883723	9.925096	10.074904	9.817668	9.877230	9.940439	10.059561	55
6	9.808969	9.883617	9.925352	10.074648	9.817813	9.877120	9.940694	10.059306	54
7	9.809119	9.883510	9.925609	10.074391	9.817958	9.877010	9.940949	10.059051	53
8	9.809269	9.883404	9.925865	10.074135	9.818103	9.876899	9.941204	10.058796	52
9	9.809419	9.883297	9.926122	10.073878	9.818247	9.876789	9.941459	10.058541	51
10	9.809569	9.883191	9.926378	10.073622	9.818392	9.876678	9.941713	10.058287	50
11	9.809718	9.883084	9.926634	10.073366	9.818536	9.876568	9.941968	10.058032	49
12	9.809868	9.882977	9.926890	10.073110	9.818681	9.876457	9.942223	10.057777	48
13	9.810017	9.882871	9.927147	10.072853	9.818825	9.876347	9.942478	10.057522	47
14	9.810167	9.882764	9.927403	10.072597	9.818969	9.876236	9.942733	10.057267	46
15	9.810316	9.882657	9.927659	10.072341	9.819113	9.876125	9.942988	10.057012	45
16	9.810465	9.882550	9.927915	10.072085	9.819257	9.876014	9.943243	10.056757	44
17	9.810614	9.882443	9.928171	10.071829	9.819401	9.875904	9.943498	10.056502	43
18	9.810763	9.882336	9.928427	10.071573	9.819545	9.875793	9.943752	10.056248	42
19	9.810912	9.882229	9.928684	10.071316	9.819689	9.875682	9.944007	10.055993	41
20	9.811061	9.882121	9.928940	10.071060	9.819832	9.875571	9.944262	10.055738	40
21	9.811210	9.882014	9.929196	10.070804	9.819976	9.875459	9.944517	10.055483	39
22	9.811358	9.881907	9.929452	10.070548	9.820120	9.875348	9.944771	10.055229	38
23	9.811507	9.881799	9.929708	10.070292	9.820263	9.875237	9.945026	10.054974	37
24	9.811655	9.881692	9.929964	10.070036	9.820406	9.875126	9.945281	10.054719	36
25	9.811804	9.881584	9.930220	10.069781	9.820550	9.875014	9.945535	10.054465	35
26	9.811952	9.881477	9.930475	10.069525	9.820693	9.874903	9.945790	10.054210	34
27	9.812100	9.881369	9.930731	10.069269	9.820836	9.874791	9.946045	10.053955	33
28	9.812248	9.881261	9.930987	10.069013	9.820979	9.874680	9.946299	10.053701	32
29	9.812396	9.881153	9.931243	10.068757	9.821122	9.874568	9.946554	10.053446	31
30	9.812544	9.881046	9.931499	10.068501	9.821265	9.874456	9.946808	10.053192	30
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	49.				48.				

Canon Triangulorum Logarithmicus.

	40.				41.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
30	9.812544	9.881046	9.931499	10.068501	9.821265	9.874456	9.946808	10.053192	30
31	9.812692	9.880938	9.931755	10.068245	9.821407	9.874344	9.947063	10.052937	29
32	9.812840	9.880830	9.932010	10.067990	9.821550	9.874232	9.947318	10.052682	28
33	9.812988	9.880722	9.932266	10.067734	9.821693	9.874121	9.947572	10.052428	27
34	9.813135	9.880613	9.932522	10.067478	9.821835	9.874009	9.947827	10.052173	26
35	9.813283	9.880505	9.932778	10.067222	9.821977	9.873896	9.948081	10.051919	25
36	9.813430	9.880397	9.933033	10.066967	9.822120	9.873782	9.948335	10.051665	24
37	9.813578	9.880289	9.933289	10.066711	9.822262	9.873672	9.948590	10.051410	23
38	9.813725	9.880180	9.933545	10.066455	9.822404	9.873560	9.948844	10.051156	22
39	9.813872	9.880072	9.933800	10.066200	9.822546	9.873448	9.949099	10.050901	21
40	9.814019	9.879963	9.934056	10.065944	9.822688	9.873335	9.949353	10.050647	20
41	9.814166	9.879855	9.934311	10.065689	9.822830	9.873223	9.949608	10.050392	19
42	9.814313	9.879746	9.934567	10.065433	9.822972	9.873110	9.949862	10.050138	18
43	9.814460	9.879637	9.934822	10.065178	9.823114	9.872998	9.950116	10.049884	17
44	9.814607	9.879529	9.935078	10.064922	9.823255	9.872885	9.950371	10.049629	16
45	9.814753	9.879420	9.935333	10.064667	9.823397	9.872772	9.950625	10.049375	15
46	9.814900	9.879311	9.935589	10.064411	9.823539	9.872659	9.950879	10.049121	14
47	9.815046	9.879202	9.935844	10.064156	9.823680	9.872547	9.951133	10.048867	13
48	9.815193	9.879093	9.936100	10.063900	9.823821	9.872434	9.951388	10.048612	12
49	9.815339	9.878984	9.936355	10.063645	9.823963	9.872321	9.951642	10.048358	11
50	9.815485	9.878875	9.936611	10.063389	9.824104	9.872208	9.951896	10.048104	10
51	9.815632	9.878766	9.936866	10.063134	9.824245	9.872095	9.952150	10.047850	9
52	9.815778	9.878656	9.937121	10.062879	9.824386	9.871981	9.952405	10.047595	8
53	9.815924	9.878547	9.937377	10.062623	9.824527	9.871868	9.952659	10.047341	7
54	9.816069	9.878438	9.937632	10.062368	9.824668	9.871755	9.952913	10.047087	6
55	9.816215	9.878328	9.937887	10.062113	9.824808	9.871641	9.953167	10.046833	5
56	9.816361	9.878219	9.938142	10.061858	9.824949	9.871528	9.953421	10.046579	4
57	9.816507	9.878109	9.938398	10.061602	9.825090	9.871414	9.953675	10.046325	3
58	9.816652	9.877999	9.938653	10.061347	9.825230	9.871301	9.953929	10.046071	2
59	9.816798	9.877890	9.938908	10.061092	9.825371	9.871187	9.954183	10.045817	1
60	9.816943	9.877780	9.939163	10.060837	9.825511	9.871073	9.954437	10.045563	0
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	49.				48.				

	42				43.				
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
0	9.825511	9.871073	9.954437	10.045563	9.833783	9.864127	9.969656	10.030344	60
1	9.825651	9.870960	9.954691	10.045309	9.833919	9.864010	9.969909	10.030091	59
2	9.825791	9.870846	9.954946	10.045054	9.834054	9.863892	9.970162	10.029838	58
3	9.825931	9.870732	9.955200	10.044800	9.834189	9.863774	9.970416	10.029584	57
4	9.826071	9.870618	9.955454	10.044546	9.834325	9.863656	9.970669	10.029331	56
5	9.826211	9.870504	9.955708	10.044292	9.834460	9.863538	9.970922	10.029078	55
6	9.826351	9.870390	9.955961	10.044039	9.834595	9.863419	9.971175	10.028825	54
7	9.826491	9.870276	9.956215	10.043785	9.834730	9.863301	9.971429	10.028571	53
8	9.826631	9.870161	9.956469	10.043531	9.834865	9.863183	9.971682	10.028318	52
9	9.826770	9.870047	9.956723	10.043277	9.834999	9.863064	9.971935	10.028065	51
10	9.826910	9.869933	9.956977	10.043023	9.835134	9.862946	9.972188	10.027812	50
11	9.827049	9.869818	9.957231	10.042769	9.835269	9.862827	9.972441	10.027559	49
12	9.827189	9.869704	9.957485	10.042515	9.835403	9.862709	9.972695	10.027305	48
13	9.827328	9.869589	9.957739	10.042261	9.835538	9.862590	9.972948	10.027052	47
14	9.827467	9.869474	9.957993	10.042007	9.835672	9.862471	9.973201	10.026799	46
15	9.827606	9.869360	9.958247	10.041753	9.835807	9.862353	9.973454	10.026546	45
16	9.827745	9.869245	9.958500	10.041500	9.835941	9.862234	9.973707	10.026293	44
17	9.827884	9.869130	9.958754	10.041246	9.836075	9.862115	9.973960	10.026040	43
18	9.828023	9.869015	9.959008	10.040992	9.836209	9.861996	9.974213	10.025787	42
19	9.828162	9.868900	9.959262	10.040738	9.836343	9.861877	9.974466	10.025534	41
20	9.828301	9.868785	9.959516	10.040484	9.836477	9.861758	9.974720	10.025280	40
21	9.828439	9.868670	9.959769	10.040231	9.836611	9.861638	9.974973	10.025027	39
22	9.828578	9.868555	9.960023	10.039977	9.836745	9.861519	9.975226	10.024774	38
23	9.828716	9.868440	9.960277	10.039723	9.836878	9.861400	9.975479	10.024521	37
24	9.828855	9.868324	9.960530	10.039470	9.837012	9.861280	9.975732	10.024268	36
25	9.828993	9.868209	9.960784	10.039216	9.837146	9.861161	9.975985	10.024015	35
26	9.829131	9.868093	9.961038	10.038962	9.837279	9.861041	9.976238	10.023762	34
27	9.829269	9.867978	9.961292	10.038708	9.837412	9.860922	9.976491	10.023509	33
28	9.829407	9.867862	9.961545	10.038455	9.837546	9.860802	9.976744	10.023256	32
29	9.829545	9.867747	9.961799	10.038201	9.837679	9.860682	9.976997	10.023003	31
30	9.829683	9.867631	9.962052	10.037948	9.837812	9.860562	9.977250	10.022750	30
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	47.				46.				

	42.					43.			
M	SIN.	Co-sin.	TAN.	Co-tan.	SIN.	Co-sin.	TAN.	Co-tan.	
30	9.829683	9.867631	9.962052	10.037948	9.837812	9.860562	9.977250	10.022750	30
31	9.829821	9.867515	9.962306	10.037694	9.837945	9.860442	9.977503	10.022497	29
32	9.829959	9.867399	9.962560	10.037440	9.838078	9.860322	9.977756	10.022244	28
33	9.830097	9.867283	9.962813	10.037187	9.838211	9.860202	9.978009	10.021991	27
34	9.830234	9.867167	9.963067	10.036933	9.838344	9.860082	9.978262	10.021738	26
35	9.830372	9.867051	9.963320	10.036680	9.838477	9.859962	9.978515	10.021485	25
36	9.830509	9.866935	9.963574	10.036426	9.838610	9.859842	9.978768	10.021232	24
37	9.830646	9.866819	9.963828	10.036172	9.838742	9.859721	9.979021	10.020979	23
38	9.830784	9.866703	9.964081	10.035919	9.838875	9.859601	9.979274	10.020726	22
39	9.830921	9.866586	9.964335	10.035665	9.839007	9.859480	9.979527	10.020473	21
40	9.831058	9.866470	9.964588	10.035412	9.839140	9.859360	9.979780	10.020220	20
41	9.831195	9.866353	9.964842	10.035158	9.839272	9.859239	9.980033	10.019967	19
42	9.831332	9.866237	9.965095	10.034905	9.839404	9.859119	9.980286	10.019714	18
43	9.831469	9.866120	9.965349	10.034651	9.839536	9.858998	9.980538	10.019462	17
44	9.831606	9.866004	9.965602	10.034398	9.839668	9.858877	9.980791	10.019209	16
45	9.831742	9.865887	9.965855	10.034145	9.839800	9.858756	9.981044	10.018956	15
46	9.831879	9.865770	9.966109	10.033891	9.839932	9.858635	9.981297	10.018703	14
47	9.832015	9.865653	9.966362	10.033638	9.840064	9.858514	9.981550	10.018450	13
48	9.832152	9.865536	9.966616	10.033384	9.840196	9.858393	9.981803	10.018197	12
49	9.832288	9.865419	9.966869	10.033131	9.840328	9.858272	9.982056	10.017944	11
50	9.832425	9.865302	9.967123	10.032877	9.840459	9.858151	9.982309	10.017691	10
51	9.832561	9.865185	9.967376	10.032624	9.840591	9.858029	9.982562	10.017438	9
52	9.832697	9.865068	9.967629	10.032371	9.840722	9.857908	9.982814	10.017186	8
53	9.832833	9.864950	9.967883	10.032117	9.840854	9.857786	9.983067	10.016933	7
54	9.832969	9.864833	9.968136	10.031864	9.840985	9.857665	9.983320	10.016680	6
55	9.833105	9.864716	9.968389	10.031611	9.841116	9.857543	9.983573	10.016427	5
56	9.833241	9.864598	9.968643	10.031357	9.841247	9.857422	9.983826	10.016174	4
57	9.833377	9.864481	9.968896	10.031104	9.841378	9.857300	9.984079	10.015921	3
58	9.833512	9.864363	9.969149	10.030851	9.841509	9.857178	9.984332	10.015668	2
59	9.833648	9.864245	9.969403	10.030597	9.841640	9.857056	9.984584	10.015416	1
60	9.833783	9.864127	9.969656	10.030344	9.841771	9.856934	9.984837	10.015163	0
	Co-sin.	SIN.	Co-tan.	TAN.	Co-sin.	SIN.	Co-tan.	TAN.	M
	47.				46.				

44.

	SIN.	Co-sin.	TAN.	Co-tan.	
0	9.841771	9.856934	9.984837	10.015162	60
1	9.841902	9.856812	9.985090	10.014910	59
2	9.842033	9.856690	9.985343	10.014657	58
3	9.842163	9.856568	9.985596	10.014404	57
4	9.842294	9.856446	9.985848	10.014152	56
5	9.842424	9.856323	9.986101	10.013899	55
6	9.842555	9.856201	9.986354	10.013646	54
7	9.842685	9.856078	9.986607	10.013393	53
8	9.842815	9.855956	9.986860	10.013140	52
9	9.842946	9.855833	9.987112	10.012888	51
10	9.843076	9.855711	9.987365	10.012635	50
11	9.843206	9.855588	9.987618	10.012382	49
12	9.843336	9.855465	9.987871	10.012129	48
13	9.843466	9.855342	9.988123	10.011877	47
14	9.843595	9.855219	9.988376	10.011624	46
15	9.843725	9.855096	9.988629	10.011371	45
16	9.843855	9.854973	9.988882	10.011118	44
17	9.843984	9.854850	9.989134	10.010866	43
18	9.844114	9.854727	9.989387	10.010613	42
19	9.844243	9.854603	9.989640	10.010360	41
20	9.844372	9.854480	9.989893	10.010107	40
21	9.844502	9.854356	9.990145	10.009855	39
22	9.844631	9.854233	9.990398	10.009602	38
23	9.844760	9.854109	9.990651	10.009349	37
24	9.844889	9.853986	9.990903	10.009097	36
25	9.845018	9.853862	9.991156	10.008844	35
26	9.845147	9.853738	9.991409	10.008591	34
27	9.845276	9.853614	9.991662	10.008338	33
28	9.845405	9.853490	9.991914	10.008086	32
29	9.845533	9.853366	9.992167	10.007833	31
30	9.845662	9.853242	9.992420	10.007580	30
	Co-sin.	SIN.	Co-tan.	TAN.	M

45.

44.

M	SIN.	Co-sin.	TAN.	Co-tan.	
30	9.845662	9.853242	9.992420	10.007580	30
31	9.845790	9.853118	9.992672	10.007328	29
32	9.845919	9.852994	9.992925	10.007075	28
33	9.846047	9.852869	9.993178	10.006822	27
34	9.846175	9.852745	9.993431	10.006569	26
35	9.846304	9.852620	9.993683	10.006317	25
36	9.846432	9.852496	9.993936	10.006064	24
37	9.846560	9.852371	9.994189	10.005811	23
38	9.846688	9.852247	9.994441	10.005559	22
39	9.846816	9.852122	9.994694	10.005306	21
40	9.846944	9.851997	9.994947	10.005053	20
41	9.847071	9.851872	9.995199	10.004801	19
42	9.847199	9.851747	9.995452	10.004548	18
43	9.847327	9.851622	9.995705	10.004295	17
44	9.847454	9.851497	9.995957	10.004043	16
45	9.847582	9.851372	9.996210	10.003790	15
46	9.847709	9.851246	9.996463	10.003537	14
47	9.847836	9.851121	9.996715	10.003285	13
48	9.847964	9.850996	9.996968	10.003032	12
49	9.848091	9.850870	9.997221	10.002779	11
50	9.848218	9.850745	9.997473	10.002527	10
51	9.848345	9.850619	9.997726	10.002274	9
52	9.848472	9.850493	9.997979	10.002021	8
53	9.848599	9.850368	9.998231	10.001769	7
54	9.848726	9.850242	9.998484	10.001516	6
55	9.848852	9.850116	9.998737	10.001263	5
56	9.848979	9.849990	9.998989	10.001011	4
57	9.849106	9.849864	9.999242	10.000758	3
58	9.849232	9.849738	9.999495	10.000505	2
59	9.849359	9.849611	9.999747	10.000253	1
60	9.849485	9.849485	10.000000	10.000000	0
	Co-sin.	SIN.	Co-tan.	TAN.	M

45.

TABULA LOGARITHMORUM LOGISTICORUM.

′	0	1	2	3	4	5	6	7	8	9
″	0	60	120	180	240	300	360	420	480	540
0	——	17782	14771	13010	11761	10792	10000	9331	8751	8239
1	35563	17710	14735	12986	11743	10777	9988	9320	8742	8231
2	32553	17639	14699	12962	11725	10763	9976	9310	8733	8223
3	30792	17570	14664	12939	11707	10749	9964	9300	8724	8215
4	29542	17501	14629	12915	11689	10734	9952	9289	8715	8207
5	28573	17434	14594	12891	11671	10720	9940	9279	8706	8199
6	27782	17368	14559	12868	11654	10706	9928	9269	8697	8191
7	27112	17302	14525	12845	11636	10692	9916	9259	8688	8183
8	26532	17238	14491	12821	11619	10678	9905	9249	8679	8175
9	26021	17175	14457	12798	11601	10663	9893	9238	8670	8167
10	25563	17112	14424	12775	11584	10649	9881	9228	8661	8159
11	25149	17050	14390	12753	11566	10635	9869	9218	8652	8152
12	24771	16990	14357	12730	11549	10621	9858	9208	8643	8144
13	24424	16930	14325	12707	11532	10608	9846	9198	8635	8136
14	24102	16871	14292	12685	11515	10594	9834	9188	8626	8128
15	23802	16812	14260	12663	11498	10580	9823	9178	8617	8120
16	23522	16755	14228	12640	11481	10566	9811	9168	8608	8112
17	23259	16698	14196	12618	11464	10552	9800	9158	8599	8104
18	23010	16642	14165	12596	11447	10539	9788	9148	8591	8097
19	22775	16587	14133	12574	11430	10525	9777	9138	8582	8089
20	22553	16532	14102	12553	11413	10512	9765	9128	8573	8081
21	22341	16478	14071	12531	11397	10498	9754	9119	856[illegible]	8073
22	22139	16425	14040	12510	11380	10484	9742	9109	8556	8066
23	21946	16372	14010	12488	11363	10471	9731	9099	8547	8058
24	21761	16320	13979	12467	11347	10458	9720	9089	8539	8050
25	21584	16269	13949	12445	11331	10444	9708	9079	8530	8043
26	21413	16218	13919	12424	11314	10431	9697	9070	8522	8035
27	21249	16168	13890	12403	11298	10418	9686	9060	8513	8027
28	21091	16118	13860	12382	11282	10404	9675	9050	8504	8020
29	20939	16069	13831	12362	11266	10391	9664	9041	8496	8012
30	20792	16021	13802	12341	11249	10378	9652	9031	8487	8004

Tabula Logarithmorum Logisticorum.

′	0	1	2	3	4	5	6	7	8	9
″	0	60	120	180	240	300	360	420	480	540
30	20792	16021	13802	12341	11249	10378	9652	9031	8487	8004
31	20649	15973	13773	12320	11233	10365	9641	9021	8479	7997
32	20512	15925	13745	12300	11217	10352	9630	9012	8470	7989
33	20378	15878	13716	12279	11201	10339	9619	9002	8462	7981
34	20248	15832	13688	12259	11186	10326	9608	8992	8453	7974
35	20122	15786	13660	12239	11170	10313	9597	8983	8445	7966
36	20000	15740	13632	12218	11154	10300	9586	8973	8437	7959
37	19881	15695	13604	12198	11138	10287	9575	8964	8428	7951
38	19765	15651	13576	12178	11123	10274	9564	8954	8420	7944
39	19652	15607	13549	12159	11107	10261	9553	8945	8411	7936
40	19542	15563	13522	12139	11091	10248	9542	8935	8403	7929
41	19435	15520	13495	12119	11076	10235	9532	8926	8395	7921
42	19331	15477	13468	12099	11061	10223	9521	8917	8386	7914
43	19228	15435	13441	12080	11045	10210	9510	8907	8378	7906
44	19128	15393	13415	12061	11030	10197	9499	8898	8370	7899
45	19031	15351	13388	12041	11015	10185	9488	8888	8361	7891
46	18935	15310	13362	12022	10999	10172	9478	8879	8353	7884
47	18842	15269	13336	12003	10984	10160	9467	8870	8345	7877
48	18751	15229	13310	11984	10969	10147	9456	8861	8337	7869
49	18661	15189	13284	11965	10954	10135	9446	8851	8328	7862
50	18573	15149	13259	11946	10939	10122	9435	8842	8320	7855
51	18487	15110	13233	11927	10924	10110	9425	8833	8312	7847
52	18403	15071	13208	11908	10909	10098	9414	8824	8304	7840
53	18320	15032	13183	11889	10894	10085	9404	8814	8296	7832
54	18239	14994	13158	11871	10880	10073	9393	8805	8288	7825
55	18159	14956	13133	11852	10865	10061	9383	8796	8279	7818
56	18081	14918	13108	11834	10850	10049	9372	8787	8271	7811
57	18004	14881	13083	11816	10835	10036	9362	8778	8263	7803
58	17929	14844	13059	11797	10821	10024	9351	8769	8255	7796
59	17855	14808	13034	11779	10806	10012	9341	8760	8247	7789
60	17782	14771	13010	11761	10792	10000	9331	8751	8239	7782

Tabula Logarithmorum Logisticorum.

′	10	11	12	13	14	15	16	17	18	19	20	21
″	600	660	720	780	840	900	960	1020	1080	1140	1200	1260
0	7782	7368	6990	6642	6320	6021	5740	5477	5229	4994	4771	4559
1	7774	7361	6984	6637	6315	6016	5736	5473	5225	4990	4768	4556
2	7767	7354	6978	6631	6310	6011	5731	5469	5221	4986	4764	4552
3	7760	7348	6972	6625	6305	6006	5727	5464	5217	4983	4760	4549
4	7753	7341	6966	6620	6300	6001	5722	5460	5213	4979	4757	4546
5	7745	7335	6960	6614	6294	5997	5718	5456	5209	4975	4753	4542
6	7738	7328	6954	6609	6289	5992	5713	5452	5205	4971	4750	4539
7	7731	7322	6948	6603	6284	5987	5709	5447	5201	4967	4746	4535
8	7724	7315	6942	6598	6279	5982	5704	5443	5197	4964	4742	4532
9	7717	7309	6936	6592	6274	5977	5700	5439	5193	4960	4739	4528
10	7710	7302	6930	6587	6269	5973	5695	5435	5189	4956	4735	4525
11	7703	7296	6924	6581	6264	5968	5691	5430	5185	4952	4732	4522
12	7696	7289	6918	6576	6259	5963	5686	5426	5181	4949	4728	4518
13	7688	7283	6912	6570	6254	5958	5682	5422	5177	4945	4724	4515
14	7681	7276	6906	6565	6248	5954	5677	5418	5173	4941	4721	4511
15	7674	7270	6900	6559	6243	5949	5673	5414	5169	4937	4717	4508
16	7667	7264	6894	6554	6238	5944	5669	5409	5165	4933	4714	4505
17	7660	7257	6888	6548	6233	5939	5664	5405	5161	4930	4710	4501
18	7653	7251	6882	6543	6228	5935	5660	5401	5157	4926	4707	4498
19	7646	7244	6877	6538	6223	5930	5655	5397	5153	4922	4703	4494
20	7639	7238	6871	6532	6218	5925	5651	5393	5149	4918	4699	4491
21	7632	7232	6865	6527	6213	5920	5646	5389	5145	4915	4696	4488
22	7625	7225	6859	6521	6208	5916	5642	5384	5141	4911	4692	4484
23	7618	7219	6853	6516	6203	5911	5637	5380	5137	4907	4689	4481
24	7611	7212	6847	6510	6198	5906	5633	5376	5133	4903	4685	4477
25	7604	7206	6841	6505	6193	5902	5629	5372	5129	4900	4682	4474
26	7597	7200	6836	6500	6188	5897	5624	5368	5125	4896	4678	4471
27	7590	7193	6830	6494	6183	5892	5620	5364	5122	4892	4675	4467
28	7583	7187	6824	6489	6178	5888	5615	5359	5118	4889	4671	4464
29	7577	7181	6818	6484	6173	5883	5611	5355	5114	4885	4668	4460
30	7570	7175	6812	6478	6168	5878	5607	5351	5110	4881	4664	4457

Tabula Logarithmorum Logisticorum.

′	10	11	12	13	14	15	16	17	18	19	20	21
″	600	660	720	780	840	900	960	1020	1080	1140	1200	1260
30	7570	7175	6812	6478	6168	5878	5607	5351	5110	4881	4664	4457
31	7563	7168	6807	6473	6163	5874	5602	5347	5106	4877	4660	4454
32	7556	7162	6801	6467	6158	5869	5598	5343	5102	4874	4657	4450
33	7549	7156	6795	6462	6153	5864	5594	5339	5098	4870	4653	4447
34	7542	7149	6789	6457	6148	5860	5589	5335	5094	4866	4650	4444
35	7535	7143	6784	6451	6143	5855	5585	5331	5090	4863	4646	4440
36	7528	7137	6778	6446	6138	5850	5580	5326	5086	4859	4643	4437
37	7522	7131	6772	6441	6133	5846	5576	5322	5082	4855	4639	4434
38	7515	7124	6766	6435	6128	5841	5572	5318	5079	4852	4636	4430
39	7508	7118	6761	6430	6123	5836	5567	5314	5075	4848	4632	4427
40	7501	7112	6755	6425	6118	5832	5563	5310	5071	4844	4629	4424
41	7494	7106	6749	6420	6113	5827	5559	5306	5067	4841	4625	4420
42	7488	7100	6743	6414	6108	5823	5554	5302	5063	4837	4622	4417
43	7481	7093	6738	6409	6103	5818	5550	5298	5059	4833	4618	4414
44	7474	7087	6732	6404	6099	5813	5546	5294	5055	4830	4615	4410
45	7467	7081	6726	6398	6094	5809	5541	5290	5051	4826	4611	4407
46	7461	7075	6721	6393	6089	5804	5537	5285	5048	4822	4608	4404
47	7454	7069	6715	6388	6084	5800	5533	5281	5044	4819	4604	4400
48	7447	7063	6709	6383	6079	5795	5528	5277	5040	4815	4601	4397
49	7441	7057	6704	6377	6074	5790	5524	5273	5036	4811	4597	4394
50	7434	7050	6698	6372	6069	5786	5520	5269	5032	4808	4594	4390
51	7427	7044	6692	6367	6064	5781	5516	5265	5028	4804	4590	4387
52	7421	7038	6687	6362	6059	5777	5511	5261	5025	4800	4587	4384
53	7414	7032	6681	6357	6055	5772	5507	5257	5021	4797	4584	4380
54	7407	7026	6676	6351	6050	5768	5503	5253	5017	4793	4580	4377
55	7401	7020	6670	6346	6045	5763	5498	5249	5013	4789	4577	4374
56	7394	7014	6664	6341	6040	5758	5494	5245	5009	4786	4573	4370
57	7387	7008	6659	6336	6035	5754	5490	5241	5005	4782	4570	4367
58	7381	7002	6653	6331	6030	5749	5486	5237	5002	4778	4566	4364
59	7374	6996	6648	6325	6025	5745	5481	5233	4998	4775	4563	4361
60	7368	6990	6642	6320	6021	5740	5477	5229	4994	4771	4559	4357
						O						

Tabula Logarithmorum Logisticorum.

′	22	23	24	25	26	27	28	29	30	31	32	33
″	1320	1380	1440	1500	1560	1620	1680	1740	1800	1860	1920	1980
0	4357	4164	3979	3802	3632	3468	3310	3158	3010	2868	2730	2596
1	4354	4161	3976	3799	3629	3465	3307	3155	3008	2866	2728	2594
2	4351	4158	3973	3796	3626	3463	3305	3153	3005	2863	2725	2592
3	4347	4155	3970	3793	3623	3460	3302	3150	3003	2861	2723	2590
4	4344	4152	3967	3791	3621	3457	3300	3148	3001	2859	2721	2588
5	4341	4149	3964	3788	3618	3454	3297	3145	2998	2856	2719	2585
6	4338	4145	3961	3785	3615	3452	3294	3143	2996	2854	2716	2583
7	4334	4142	3958	3782	3612	3449	3292	3140	2993	2852	2714	2581
8	4331	4139	3955	3779	3610	3446	3289	3138	2991	2849	2712	2579
9	4328	4136	3952	3776	3607	3444	3287	3135	2989	2847	2710	2577
10	4325	4133	3949	3773	3604	3441	3284	3133	2986	2845	2707	2574
11	4321	4130	3946	3770	3601	3438	3282	3130	2984	2842	2705	2572
12	4318	4127	3943	3768	3598	3436	3279	3128	2981	2840	2703	2570
13	4315	4124	3940	3765	3596	3433	3276	3125	2979	2838	2701	2568
14	4311	4120	3937	3762	3593	3431	3274	3123	2977	2835	2698	2566
15	4308	4117	3934	3759	3590	3428	3271	3120	2974	2833	2696	2564
16	4305	4114	3931	3756	3587	3425	3269	3118	2972	2831	2694	2561
17	4302	4111	3928	3753	3585	3423	3266	3115	2969	2828	2692	2559
18	4298	4108	3925	3750	3582	3420	3264	3113	2967	2826	2689	2557
19	4295	4105	3922	3747	3579	3417	3261	3110	2965	2824	2687	2555
20	4292	4102	3919	3745	3576	3415	3259	3108	2962	2821	2685	2553
21	4289	4099	3917	3742	3574	3412	3256	3105	2960	2819	2683	2551
22	4285	4096	3914	3739	3571	3409	3253	3103	2958	2817	2681	2548
23	4282	4092	3911	3736	3568	3407	3251	3101	2955	2815	2678	2546
24	4279	4089	3908	3733	3565	3404	3248	3098	2953	2812	2676	2544
25	4276	4086	3905	3730	3563	3401	3246	3096	2950	2810	2674	2542
26	4273	4083	3902	3727	3560	3399	3243	3093	2948	2808	2672	2540
27	4269	4080	3899	3725	3557	3396	3241	3091	2946	2805	2669	2538
28	4266	4077	3896	3722	3555	3393	3238	3088	2943	2803	2667	2535
29	4263	4074	3893	3719	3552	3391	3236	3086	2941	2801	2665	2533
30	4260	4071	3890	3716	3549	3388	3233	3083	2939	2798	2663	2531

′	22	23	24	25	26	27	28	29	30	31	32	33
″	1320	1380	1440	1500	1560	1620	1680	1740	1800	1860	1920	1980
30	4260	4071	3890	3716	3549	3388	3233	3083	2939	2798	2663	2531
31	4256	4068	3887	3713	3546	3386	3231	3081	2936	2796	2660	2529
32	4253	4065	3884	3710	3544	3383	3228	3078	2934	2794	2658	2527
33	4250	4062	3881	3708	3541	3380	3225	3076	2931	2792	2656	2525
34	4247	4059	3878	3705	3538	3378	3223	3073	2929	2789	2654	2522
35	4244	4055	3875	3702	3535	3375	3220	3071	2927	2787	2652	2520
36	4240	4052	3872	3699	3533	3372	3218	3069	2924	2785	2649	2518
37	4237	4049	3869	3696	3530	3370	3215	3066	2922	2782	2647	2516
38	4234	4046	3866	3693	3527	3367	3213	3064	2920	2780	2645	2514
39	4231	4043	3863	3691	3525	3365	3210	3061	2917	2778	2643	2512
40	4228	4040	3860	3688	3522	3362	3208	3059	2915	2775	2640	2510
41	4224	4037	3857	3685	3519	3359	3205	3056	2912	2773	2638	2507
42	4221	4034	3855	3682	3516	3357	3203	3054	2910	2771	2636	2505
43	4218	4031	3852	3679	3514	3354	3200	3052	2908	2769	2634	2503
44	4215	4028	3849	3677	3511	3351	3198	3049	2905	2766	2632	2501
45	4212	4025	3846	3674	3508	3349	3195	3047	2903	2764	2629	2499
46	4209	4022	3843	3671	3506	3346	3193	3044	2901	2762	2627	2497
47	4205	4019	3840	3668	3503	3344	3190	3042	2898	2760	2625	2494
48	4202	4016	3837	3665	3500	3341	3188	3039	2896	2757	2623	2492
49	4199	4013	3834	3663	3497	3338	3185	3037	2894	2755	2621	2490
50	4196	4010	3831	3660	3495	3336	3183	3034	2891	2753	2618	2488
51	4193	4007	3828	3657	3492	3333	3180	3032	2889	2750	2616	2486
52	4189	4004	3825	3654	3489	3331	3178	3030	2887	2748	2614	2484
53	4186	4001	3822	3651	3487	3328	3175	3027	2884	2746	2612	2482
54	4183	3998	3820	3649	3484	3325	3173	3025	2882	2744	2610	2480
55	4180	3995	3817	3646	3481	3323	3170	3022	2880	2741	2607	2477
56	4177	3991	3814	3643	3479	3320	3168	3020	2877	2739	2605	2475
57	4174	3988	3811	3640	3476	3318	3165	3018	2875	2737	2603	2473
58	4171	3985	3808	3637	3473	3315	3163	3015	2873	2735	2601	2471
59	4167	3982	3805	3635	3471	3313	3160	3013	2870	2732	2599	2469
60	4164	3979	3802	3632	3468	3310	3158	3010	2868	2730	2596	2467

Tabula Logarithmorum Logisticorum.

′	34	35	36	37	38	39	40	41	42	43	44	45
″	2040	2100	2160	2220	2280	2340	2400	2460	2520	2580	2640	2700
0	2467	2341	2218	2099	1984	1871	1761	1654	1549	1447	1347	1249
1	2465	2339	2216	2098	1982	1869	1759	1652	1547	1445	1345	1248
2	2462	2337	2214	2096	1980	1867	1757	1650	1546	1443	1344	1246
3	2460	2335	2212	2094	1978	1865	1755	1648	1544	1442	1342	1245
4	2458	2333	2210	2092	1976	1863	1754	1647	1542	1440	1340	1243
5	2456	2331	2208	2090	1974	1862	1752	1645	1540	1438	1339	1241
6	2454	2328	2206	2088	1972	1860	1750	1643	1539	1437	1337	1240
7	2452	2326	2204	2086	1970	1858	1748	1641	1537	1435	1335	1238
8	2450	2324	2202	2084	1968	1856	1746	1640	1535	1433	1334	1237
9	2448	2322	2200	2082	1967	1854	1745	1638	1534	1432	1332	1235
10	2445	2320	2198	2080	1965	1852	1743	1636	1532	1430	1331	1233
11	2443	2318	2196	2078	1963	1850	1741	1634	1530	1428	1329	1232
12	2441	2316	2194	2076	1961	1849	1739	1633	1528	1427	1327	1230
13	2439	2314	2192	2074	1959	1847	1737	1631	1527	1425	1326	1229
14	2437	2312	2190	2072	1957	1845	1736	1629	1525	1423	1324	1227
15	2435	2310	2188	2070	1955	1843	1734	1627	1523	1422	1322	1225
16	2433	2308	2186	2068	1953	1841	1732	1626	1522	1420	1321	1224
17	2431	2306	2184	2066	1951	1839	1730	1624	1520	1418	1319	1222
18	2429	2304	2182	2064	1950	1838	1728	1622	1518	1417	1317	1221
19	2426	2302	2180	2062	1948	1836	1727	1620	1516	1415	1316	1219
20	2424	2300	2178	2061	1946	1834	1725	1619	1515	1413	1314	1217
21	2422	2298	2176	2059	1944	1832	1723	1617	1513	1412	1313	1216
22	2420	2296	2174	2057	1942	1830	1721	1615	1511	1410	1311	1214
23	2418	2294	2172	2055	1940	1828	1719	1613	1510	1408	1309	1213
24	2416	2291	2170	2053	1938	1827	1718	1612	1508	1407	1308	1211
25	2414	2289	2169	2051	1936	1825	1716	1610	1506	1405	1306	1209
26	2412	2287	2167	2049	1934	1823	1714	1608	1504	1403	1304	1208
27	2410	2285	2165	2047	1933	1821	1712	1606	1503	1402	1303	1206
28	2408	2283	2163	2045	1931	1819	1711	1605	1501	1400	1301	1205
29	2405	2281	2161	2043	1929	1817	1709	1603	1499	1398	1300	1203
30	2403	2279	2159	2041	1927	1816	1707	1601	1498	1397	1298	1201

Tabula Logarithmorum Logisticorum.

′	34	35	36	37	38	39	40	41	42	43	44	45
″	2040	2100	2160	2220	2280	2340	2400	2460	2520	2580	2640	2700
30	2403	2279	2159	2041	1927	1816	1707	1601	1498	1397	1298	1201
31	2401	2277	2157	2039	1925	1814	1705	1599	1496	1395	1296	1200
32	2399	2275	2155	2037	1923	1812	1703	1598	1494	1393	1295	1198
33	2397	2273	2153	2035	1921	1810	1702	1596	1493	1392	1293	1197
34	2395	2271	2151	2033	1919	1808	1700	1594	1491	1390	1291	1195
35	2393	2269	2149	2032	1918	1806	1698	1592	1489	1388	1290	1193
36	2391	2267	2147	2030	1916	1805	1696	1591	1487	1387	1288	1192
37	2389	2265	2145	2028	1914	1803	1694	1589	1486	1385	1287	1190
38	2387	2263	2143	2026	1912	1801	1693	1587	1484	1383	1285	1189
39	2384	2261	2141	2024	1910	1799	1691	1585	1482	1382	1283	1187
40	2382	2259	2139	2022	1908	1797	1689	1584	1481	1380	1282	1186
41	2380	2257	2137	2020	1906	1795	1687	1582	1479	1378	1280	1184
42	2378	2255	2135	2018	1904	1794	1686	1580	1477	1377	1278	1182
43	2376	2253	2133	2016	1903	1792	1684	1578	1476	1375	1277	1181
44	2374	2251	2131	2014	1901	1790	1682	1577	1474	1373	1275	1179
45	2372	2249	2129	2012	1899	1788	1680	1575	1472	1372	1274	1178
46	2370	2247	2127	2010	1897	1786	1678	1573	1470	1370	1272	1176
47	2368	2245	2125	2009	1895	1785	1677	1571	1469	1368	1270	1174
48	2366	2243	2123	2007	1893	1783	1675	1570	1467	1367	1269	1173
49	2364	2241	2121	2005	1891	1781	1673	1568	1465	1365	1267	1171
50	2362	2239	2119	2003	1889	1779	1671	1566	1464	1363	1266	1170
51	2359	2237	2117	2001	1888	1777	1670	1565	1462	1362	1264	1168
52	2357	2235	2115	1999	1886	1775	1668	1563	1460	1360	1262	1167
53	2355	2233	2113	1997	1884	1774	1666	1561	1459	1359	1261	1165
54	2353	2231	2111	1995	1882	1772	1664	1559	1457	1357	1259	1163
55	2351	2229	2109	1993	1880	1770	1663	1558	1455	1355	1257	1162
56	2349	2227	2107	1991	1878	1768	1661	1556	1454	1354	1256	1160
57	2347	2225	2105	1989	1876	1766	1659	1554	1452	1352	1254	1159
58	2345	2223	2103	1987	1875	1765	1657	1552	1450	1350	1253	1157
59	2343	2220	2101	1986	1873	1763	1655	1551	1449	1349	1251	1156
60	2341	2218	2099	1984	1871	1761	1654	1549	1447	1347	1249	1154

Tabula Logarithmorum Logisticorum.

′	46	47	48	49	50	51	52	53	54	55	56	57	58	59
″	2760	2820	2880	2940	3000	3060	3120	3180	3240	3300	3360	3420	3480	3540
0	1154	1061	969	880	792	706	621	539	458	378	300	223	147	73
1	1152	1059	968	878	790	704	620	537	456	377	298	221	146	72
2	1151	1057	966	877	789	703	619	536	455	375	297	220	145	71
3	1149	1056	965	875	787	702	617	535	454	374	296	219	143	69
4	1148	1054	963	874	786	700	616	533	452	373	294	218	142	68
5	1146	1053	962	872	785	699	615	532	451	371	293	216	141	67
6	1145	1051	960	871	783	697	613	531	450	370	292	215	140	66
7	1143	1050	959	869	782	696	612	529	448	369	291	214	139	64
8	1141	1048	957	868	780	694	610	528	447	367	289	213	137	63
9	1140	1047	956	866	779	693	609	526	446	366	288	211	136	62
10	1138	1045	954	865	777	692	608	525	444	365	287	210	135	61
11	1137	1044	953	863	776	690	606	524	443	363	285	209	134	60
12	1135	1042	951	862	774	689	605	522	442	362	284	208	132	58
13	1134	1041	950	860	773	687	603	521	440	361	283	206	131	57
14	1132	1039	948	859	772	686	602	520	439	359	282	205	130	56
15	1130	1037	947	857	770	685	601	518	438	358	280	204	129	55
16	1129	1036	945	856	769	683	599	517	436	357	279	202	127	53
17	1127	1034	944	855	767	682	598	516	435	356	278	201	126	52
18	1126	1033	942	853	766	680	596	514	434	354	276	200	125	51
19	1124	1031	941	852	764	679	595	513	432	353	275	199	124	50
20	1123	1030	939	850	763	678	594	512	431	352	274	197	122	49
21	1121	1028	938	849	762	676	592	510	430	350	273	196	121	47
22	1119	1027	936	847	760	675	591	509	428	349	271	195	120	46
23	1118	1025	935	846	759	673	590	507	427	348	270	194	119	45
24	1116	1024	933	844	757	672	588	506	426	346	269	192	117	44
25	1115	1022	932	843	756	670	587	505	424	345	267	191	116	42
26	1113	1021	930	841	754	669	585	503	423	344	266	190	115	41
27	1112	1019	929	840	753	668	584	502	422	342	265	189	114	40
28	1110	1018	927	838	751	666	583	501	420	341	264	187	112	39
29	1109	1016	926	837	750	665	581	499	419	340	262	186	111	38
30	1107	1015	924	835	749	663	580	498	418	339	261	185	110	36

Tabula Logarithmorum Logisticorum.

′	46	47	48	49	50	51	52	53	54	55	56	57	58	59
″	2760	2820	2880	2940	3000	3060	3120	3180	3240	3300	3360	3420	3480	3540
30	1107	1015	924	835	749	663	580	498	418	339	261	185	110	36
31	1105	1013	923	834	747	662	579	497	416	337	260	184	109	35
32	1104	1012	921	833	746	661	577	495	415	336	258	182	107	34
33	1102	1010	920	831	744	659	576	494	414	335	257	181	106	33
34	1101	1008	918	830	743	658	574	493	412	333	256	180	105	31
35	1099	1007	917	828	741	656	573	491	411	332	255	179	104	30
36	1098	1005	915	827	740	655	572	490	410	331	253	177	103	29
37	1096	1004	914	825	739	654	570	489	408	329	252	176	101	28
38	1095	1002	912	824	737	652	569	487	407	328	251	175	100	27
39	1093	1001	911	822	736	651	568	486	406	327	250	174	99	25
40	1091	999	909	821	734	649	566	484	404	326	248	172	98	24
41	1090	998	908	819	733	648	565	483	403	324	247	171	96	23
42	1088	996	906	818	731	647	563	482	402	323	246	170	95	22
43	1087	995	905	816	730	645	562	480	400	322	244	169	94	21
44	1085	993	903	815	729	644	561	479	399	320	243	167	93	19
45	1084	992	902	814	727	642	559	478	398	319	242	166	91	18
46	1082	990	900	812	726	641	558	476	396	318	241	165	90	17
47	1081	989	899	811	724	640	557	475	395	316	239	163	89	16
48	1079	987	897	809	723	638	555	474	394	315	238	162	88	15
49	1078	986	896	808	721	637	554	472	392	314	237	161	87	13
50	1076	984	894	806	720	635	552	471	391	313	235	160	85	12
51	1074	983	893	805	719	634	551	470	390	311	234	158	84	11
52	1073	981	891	803	717	633	550	468	388	310	233	157	83	10
53	1071	980	890	802	716	631	548	467	387	309	232	156	82	8
54	1070	978	888	801	714	630	547	466	386	307	230	155	80	7
55	1068	977	887	799	713	628	546	464	384	306	229	153	79	6
56	1067	975	885	798	711	627	544	463	383	305	228	152	78	5
57	1065	974	884	796	710	626	543	462	382	304	227	151	77	4
58	1064	972	883	795	709	624	541	460	381	302	225	150	75	2
59	1062	971	881	793	707	623	540	459	379	301	224	148	74	1
60	1061	969	880	792	706	621	539	458	378	300	223	147	73	0

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